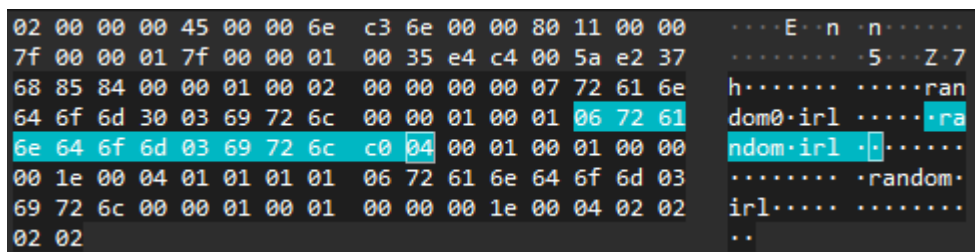


CSCE 612 / HW2

Case 1

A. random0.irl

```
Lookup : random0.irl
Query : random0.irl, type 1, TXID 0x6885
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 1 ms with 82 bytes
TXID: 0x6885, Flags: 0x8400, Questions: 1, Answers: 2, Authority: 0, Additional: 0
succeeded with Rcode = 0
----- [questions] -----
random0.irl, type 1, class 1
----- [answers] -----
++ invalid record: jump into fixed DNS header (offset 4 inside header)
```



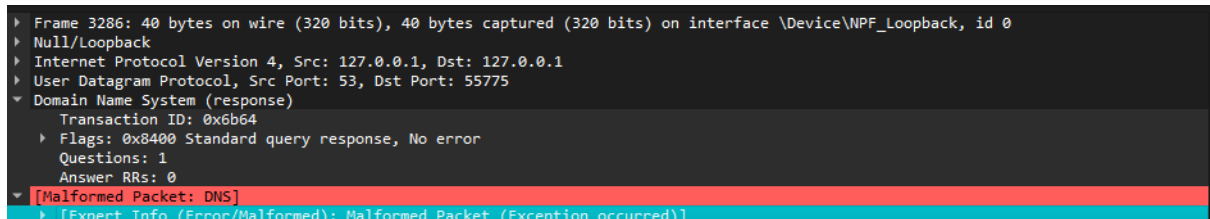
The previous Wireshark output reveals a jump into the fixed DNS header.

A pointer (0xC0 0x04) directs to an offset within the fixed DNS header. Since 4 falls within the range of 0-12 (the size of the fixed DNS header), this results in an invalid reference.

Thus, the error message correctly identifies the issue.

B. random3.irl

```
Lookup : random3.irl
Query : random3.irl, type 1, TXID 0x6B64
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 1 ms with 8 bytes
++ invalid reply: Packet smaller than fixed DNS header
```



The response is only 8 bytes long, which is smaller than the standard 12-byte fixed DNS header. This indicates an issue with the response format.

To further validate this, the Wireshark output below confirms the malformed nature of the packet.

The packet is flagged as a **malformed DNS packet**, reinforcing that the response is incorrectly formatted.

C. random5.irl

```
Lookup : random5.irl
Query : random5.irl, type 1, TXID 0x6DA9
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 1 ms with 71 bytes
TXID: 0x6DA9, 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

> Frame 3750: 103 bytes on wire (824 bits), 103 bytes captured (824 bits) on interface \Device\NPF_{...}, id 0
> Null/Loopback
> Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
> User Datagram Protocol, Src Port: 53, Dst Port: 65016
> Domain Name System (response)
  Transaction ID: 0x6da9
  > Flags: 0x8400 Standard query response, No error
  Questions: 1
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 0
  > Queries
  > Answers
    > random.irl: type A, class IN, addr 1.1.1.1
      Name: random.irl
      Type: A (1) (Host Address)
      Class: IN (0x0001)
      Time to live: 30 (30 seconds)
      Data length: 4
      Address: 1.1.1.1
    > [Malformed Packet: DNS]
      > [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
        [Malformed Packet (Exception occurred)]
        [Severity level: Error]
        [Group: Malformed]
```

0000	02 00 00 00 45 00 00 63	c3 72 00 00 80 11 00 00	.....E..c..r.....
0010	7f 00 00 01 7f 00 00 01	00 35 fd f8 00 4f e0 42	.....5...O..B
0020	6d a9 84 00 00 01 00 02	00 00 00 00 07 72 61 6e	m.....ran
0030	64 6f 6d 35 03 69 72 6c	00 00 01 00 01 06 72 61	dom5.irl.....ra
0040	6e 64 6f 6d 03 69 72 6c	00 00 01 00 01 00 00 00	ndom.irl.....
0050	1e 00 04 01 01 01 01 c0	6a 00 01 00 01 00 00 00	.....[.]j.....
0060	1e 00 04 02 02 02 02		.....

Here we can see that an issue occurred in the second answer, where a jump exceeded the packet boundary of **71 bytes**. Additionally, examining the Wireshark output confirms this issue. The response packet contains a **malformed DNS entry**, as indicated by the error message. The jump at **offset 6A (decimal 106)** attempts to reference data beyond the valid bounds of the packet, leading to a **packet parsing failure**.

D. random6.irl

```

Microsoft Visual Studio Debug Console

lookup : random6.irl
query  : random6.irl, type 1, TXID 0x7213
server : 127.0.0.1
*****
attempt 0 with 29 bytes... response in 0 ms with 59 bytes
  TXID: 0x7213, 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 detected (offset 43 revisited)

```

```

▼ Answers
  ▼ random6.irl: type CNAME, class IN, cname <Name contains a pointer that loops>
    Name: random6.irl
    Type: CNAME (5) (Canonical NAME for an alias)
    Class: IN (0x0001)
    Time to live: 30 (30 seconds)
    Data length: 2
    CNAME: <Name contains a pointer that loops>
  ▼ <Name contains a pointer that loops>: type A, class IN, addr 2.2.2.2
    Name: <Name contains a pointer that loops>
    Type: A (1) (Host Address)
    Class: IN (0x0001)
    Time to live: 30 (30 seconds)
    Data length: 4
    Address: 2.2.2.2

```

A jump loop appears to be present in the first answer of the response. The console output confirms this issue by detecting an invalid record due to a repeated offset (offset 43 revisited).

Wireshark further verifies this problem, showing that the CNAME field contains a pointer that loops back to an earlier position. This recursive reference prevents proper resolution and results in an incorrectly formatted DNS packet.

Case 2 (random1.irl)

```

lookup : random1.irl
query  : random1.irl, type 1, TXID 0x4AAE
server : 127.0.0.1
*****
attempt 0 with 29 bytes... response in 1 ms with 468 bytes
  TXID: 0x4AAE, 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.evill.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 in Additional (Declared: 65535 Additional but only 11 found)

```

In this DNS query response, the program detected an inconsistency in the number of additional records **declared** versus the **actual number found**. The response header indicates 65,535 additional

records, an extremely high and likely incorrect value. However, upon parsing, only 11 additional records were present in the response. Which implies a malformed DNS response.

Case 3 (random7.irl)

```
Microsoft Visual Studio Debug Console
Lookup : random7.irl
Query : random7.irl, type 1, TXID 0x74B7
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 0 ms with 42 bytes
TXID: 0x74B7, 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 (e.g., 0xC0 and the packet ends)

0000 02 00 00 00 45 00 00 46 c3 7a 00 00 80 11 00 00 ....E..F..z.....
0010 7f 00 00 01 7f 00 00 01 00 35 d6 49 00 32 4d 71 .....5.I.2Mq
0020 74 b7 84 00 00 01 00 02 00 00 00 00 07 72 61 6e t.....ran
0030 64 6f 6d 37 03 69 72 6c 00 00 01 00 01 c0 0c 00 dom7.irl.....
0040 05 00 01 00 00 00 1e 00 01 c0 .....
```

The response packet for **random7.irl** contains a truncated jump offset, as indicated by the **0xC0** byte at the end of the packet. Normally, a **0xC0XX** compression pointer should be followed by a valid offset within the packet. However, in this case, **0xC0** appears at the very end, meaning there is no second byte to complete the offset. This results in an invalid record because the jump target cannot be determined, confirming the "**truncated jump offset**" error.

Case 4 (Random Malformed Responses - random4.irl)

A. truncated name

```
Lookup : random4.irl
Query : random4.irl, type 1, TXID 0x755D
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 1 ms with 250 bytes
TXID: 0x755D, Flags: 0x8400, Questions: 1, Answers: 1, Authority: 0, Additional: 11
succeeded with Rcode = 0
----- [questions] -----
random4.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
++ invalid record: truncated name (label length 7, but packet ends)
```

02 00 00 00 45 00 01 16	c3 7c 00 00 80 11 00 00	....E....
7f 00 00 01 7f 00 00 01	00 35 d7 32 01 02 9a a4	.....5.2....
75 5d 84 00 00 01 00 01	00 00 00 0b 07 72 61 6e	u].....random4.irl
64 6f 6d 34 03 69 72 6c	00 00 01 00 01 06 72 61	.....random.irl
6e 64 6f 6d 03 69 72 6c	00 00 01 00 01 00 00 00	..... Episode
1e 00 04 01 01 01 01 07	45 70 69 73 6f 64 65 02	IV.....
49 56 00 00 01 00 01 00	00 00 1e 00 04 02 02 02	..A·NEW· HOPE...
02 01 41 03 4e 45 57 04	48 4f 50 45 00 00 01 00	..... It·i
01 00 00 00 1e 00 04 02	02 02 02 02 49 74 02 69	s·a·peri od·of·ci
73 01 61 06 70 65 72 69	6f 64 02 6f 66 05 63 69	vil·war·
76 69 6c 03 77 61 72 00	00 01 00 01 00 00 00 1e	..... Rebel·spa
00 04 02 02 02 02 05 52	65 62 65 6c 0a 73 70 61	ceships·
63 65 73 68 69 70 73 00	00 01 00 01 00 00 00 1e	.....s triking·
00 04 02 02 02 02 08 73	74 72 69 6b 69 6e 67 04	from·a·h idden·ba
66 72 6f 6d 01 61 06 68	69 64 64 65 6e 04 62 61	se.....
73 65 00 00 01 00 01 00	00 00 1e 00 04 02 02 02	..have·w on·their
02 04 68 61 76 65 03 77	6f 6e 05 74 68 65 69 72	·first·v id
05 66 69 72 73 74 07 76	69 63	

```

Frame 565: 282 bytes on wire (2256 bits), 282 bytes captured (2256 bits) on interface \Device\NPF_{...}, id 0
Null/Loopback
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
User Datagram Protocol, Src Port: 53, Dst Port: 55090
Domain Name System (response)
  Transaction ID: 0x755d
  Flags: 0x8400 Standard query response, No error
  Questions: 1
  Answer RRs: 1
  Authority RRs: 0
  Additional RRs: 11
  Queries
  Answers
    random.irl: type A, class IN, addr 1.1.1.1
      Name: random.irl
      Type: A (1) (Host Address)
      Class: IN (0x0001)
      Time to live: 30 (30 seconds)
      Data length: 4
      Address: 1.1.1.1
  Additional records
  [Malformed Packet: DNS]
    [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
      [Malformed Packet (Exception occurred)]
      [Severity level: Error]
      [Group: Malformed]

```

The DNS response contains a truncated name, as indicated by the final part of the record being cut off before the expected end. The response includes a label with a length of 7 (0x07), but the packet ends before the full name can be read. This is evident in the hex dump, where the expected characters are missing or incomplete.

In Wireshark, this is identified as a malformed packet, confirming that the response is incorrectly formatted. The issue occurs because the packet does not contain enough data to complete the name, leading to an error when parsing.

B. RR value length stretches the answer beyond the packet


```

Lookup : random4.irl
Query  : random4.irl, type 1, TXID 0x7BD8
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 0 ms with 349 bytes
TXID: 0x7BD8, Flags: 0x8400, Questions: 1, Answers: 1, Authority: 0, Additional: 11
succeeded with Rcode = 0
----- [questions] -----
random4.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
++ invalid record: RR value length stretches the answer beyond packet

```

0000	02 00 00 00 45 00 01 79	c3 90 00 00 80 11 00 00	....E..y
0010	7f 00 00 01 7f 00 00 01	00 35 c0 18 01 65 84 9c	.....5...e..
0020	7b d8 84 00 00 01 00 01	00 00 00 0b 07 72 61 6e	{..... ..ran
0030	64 6f 6d 34 03 69 72 6c	00 00 01 00 01 06 72 61	dom4.irl .....ra
0040	6e 64 6f 6d 03 69 72 6c	00 00 01 00 01 00 00 00	ndom.irl
0050	1e 00 04 01 01 01 01 07	45 70 69 73 6f 64 65 02	..... Episode.
0060	49 56 00 00 01 00 01 00	00 00 1e 00 04 02 02 02	IV.....
0070	02 01 41 03 4e 45 57 04	48 4f 50 45 00 00 01 00	..A·NEW· HOPE...
0080	01 00 00 00 1e 00 04 02	02 02 02 02 49 74 02 69	..... ..It.i
0090	73 01 61 06 70 65 72 69	6f 64 02 6f 66 05 63 69	s·a·peri od·of·ci
00a0	76 69 6c 03 77 61 72 00	00 01 00 01 00 00 00 1e	vil·war·
00b0	00 04 02 02 02 02 05 52	65 62 65 6c 0a 73 70 61	.....R ebel·spa
00c0	63 65 73 68 69 70 73 00	00 01 00 01 00 00 00 1e	ceships·
00d0	00 04 02 02 02 02 08 73	74 72 69 6b 69 6e 67 04	.....s triking·
00e0	66 72 6f 6d 01 61 06 68	69 64 64 65 6e 04 62 61	from·a·h idden·ba
00f0	73 65 00 00 01 00 01 00	00 00 1e 00 04 02 02 02	se.....
0100	02 04 68 61 76 65 03 77	6f 6e 05 74 68 65 69 72	..have·w on·their
0110	05 66 69 72 73 74 07 76	69 63 74 6f 72 79 00 00	·first·v ictory·
0120	01 00 01 00 00 00 1e 00	04 02 02 02 02 07 61 67	..... .....
0130	61 69 6e 73 74 03 74 68	65 04 65 76 69 6c 08 47	ainst·th e·evil·G
0140	61 6c 61 63 74 69 63 06	45 6d 70 69 72 65 00 00	alactic· Empire·
0150	01 00 01 00 00 00 1e 00	04 02 02 02 02 06 44 75	..... .....
0160	72 69 6e 67 03 74 68 65	06 62 61 74 74 6c 65 00	ring·the ·battle·
0170	00 01 00 01 00 00 00 1e	00 04 02 02 02	..... .....

```

[Malformed Packet: DNS]
  [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
    [Malformed Packet (Exception occurred)]
    [Severity level: Error]
    [Group: Malformed]

```

In the highlighted section of the DNS response, we observe the sequence **00 04 02 02 02**. The **04** byte represents the declared length of the RR (Resource Record) value. However, if the remaining packet size is less than the declared **4 bytes**, this results in an out-of-bounds read, leading to the error "**RR value length stretches the answer beyond the packet.**" This discrepancy indicates a malformed DNS response where the actual data does not match the specified length, which can be caused by corruption or incorrect encoding of the response.

C. Truncated RR answer header

```

Lookup : random4.irl
Query : random4.irl, type 1, TXID 0x7E0D
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 2 ms with 214 bytes
TXID: 0x7E0D, Flags: 0x8400, Questions: 1, Answers: 1, Authority: 0, Additional: 11
succeeded with Rcode = 0
----- [questions] -----
random4.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
++ invalid record: Truncated RR answer header in Additional (only 3 bytes available, expected 10)

```

```

02 00 00 00 45 00 00 f2 c3 aa 00 00 80 11 00 00 .....E.....
7f 00 00 01 7f 00 00 01 00 35 e3 7f 00 de 29 16 .....5....)
7e 0d 84 00 00 01 00 01 00 00 00 0b 07 72 61 6e .....ran
64 6f 6d 34 03 69 72 6c 00 00 01 00 01 06 72 61 dom4.irl....ra
6e 64 6f 6d 03 69 72 6c 00 00 01 00 01 00 00 00 ndom.irl.....
1e 00 04 01 01 01 01 07 45 70 69 73 6f 64 65 02 .....Episode
49 56 00 00 01 00 01 00 00 00 1e 00 04 02 02 02 IV.....
02 01 41 03 4e 45 57 04 48 4f 50 45 00 00 01 00 ..A·NEW·HOPE...
01 00 00 00 1e 00 04 02 02 02 02 02 49 74 02 69 .....It·i
73 01 61 06 70 65 72 69 6f 64 02 6f 66 05 63 69 s·a·peri od·of·ci
76 69 6c 03 77 61 72 00 00 01 00 01 00 00 00 1e vil·war·.....
00 04 02 02 02 02 05 52 65 62 65 6c 0a 73 70 61 .....R ebel·spa
63 65 73 68 69 70 73 00 00 01 00 01 00 00 00 1e ceships·.....
00 04 02 02 02 02 08 73 74 72 69 6b 69 6e 67 04 .....s triking·
66 72 6f 6d 01 61 06 68 69 64 64 65 6e 04 62 61 from·a·h idden·ba
73 65 00 00 01 00 .....se....

```

```

[Malformed Packet: DNS]
  [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
    [Malformed Packet (Exception occurred)]
    [Severity level: Error]
    [Group: Malformed]

```

In the response, the additional section includes a **Resource Record (RR) answer header**, which is expected to be **10 bytes** long. However, only **3 bytes** are available before the packet ends. This results in a malformed packet error: **"Truncated RR answer header in Additional (only 3 bytes available, expected 10)"**, as confirmed by both the hex dump and the error message in Wireshark. As highlighted in red, if we compare them we can easily detect how is the second highlighted chunk is truncated.

Extra Credit

the random8.irl server randomly generates replies that fits a random “lol’s” inside the dns responses. This could lead to several malformed packets which for example includes too long label (label > 63 as per RFC 1035) (as shown below, after the code). Also, some malformed **DNS answer header** responses with different **DNS answer header** Types, Classes, TTLs and Data length that exceeds remaining bytes in the packet (as described in previous cases).

For example: ++ invalid record: label too long (label length 111 exceeds 63)

This error is caught using the following check in the code:

```
int label_length = *ptr++;

// Ensure valid label length (max 63 according to RFC 1035)
if (label_length > 63) {
    printf("    ++ invalid record: label too long (label length %d exceeds 63)\n", label_length);
    exit(0);
}
```

This check enforces the **RFC 1035** standard ([RFC 1035 - Section 3.1](#)), which limits individual DNS labels to a **maximum of 63 bytes**. Since random8.irl generates unpredictable responses, some labels exceed this limit, causing the error to be detected and reported by our parser.

```
Microsoft Visual Studio Debug Console
Lookup : random8.irl
Query : random8.irl, type 1, TXID 0x5CC1
Server : 127.0.0.1
*****
Attempt 0 with 29 bytes... response in 3 ms with 468 bytes
  TXID: 0x5CC1, Flags: 0x8400, Questions: 1, Answers: 1, Authority: 0, Additional: 11
  succeeded with Rcode = 0
  ----- [questions] -----
  random8.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.evill.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
  ++ invalid record: label too long (label length 111 exceeds 63)
```

Others could be checked with multiple checks like these for example:

```
if (ansHeader->_class != htons(1) && ansHeader->_class != htons(3)) {
    printf("    ++ invalid record: Unsupported DNS class (0x%04X)\n", ntohs(ansHeader->_class));
    return;
}

if (ttl > 31536000) { // One year in seconds
    printf("    ++ invalid record: TTL too high (%u seconds exceeds 1 year)\n", ttl);
    return;
}
```

Example on how do responses with “lol’s” could look like:

```
0000 02 00 00 00 45 00 01 f0 06 31 00 00 80 11 00 00  ....E...1....
0010 7f 00 00 01 7f 00 00 01 00 35 f6 81 01 dc 87 9d  ....5....
0020 78 b2 84 00 00 01 00 01 00 00 00 0b 07 72 61 6e  x.....ran
0030 64 6f 6d 38 03 69 72 6c 00 00 01 00 01 06 72 61  dom8.irl....ra
0040 6e 64 6f 6d 03 69 72 6c 00 00 01 00 01 00 00 00  ndom.irl....
0050 1e 00 04 01 01 01 01 07 45 70 69 73 6f 64 65 02  ....Episode...
0060 49 56 00 00 01 00 03 00 00 00 1e 00 04 02 02 02  IV.....
0070 02 01 41 03 4e 45 57 04 48 4f 50 45 00 00 01 00  ..A NEW HOPE...
0080 03 00 00 00 1e 00 04 02 02 02 02 02 49 74 02 69  ....It i
0090 73 01 61 06 70 65 72 69 6f 64 02 6f 66 05 63 69  s a period of ci
00a0 76 69 6c 03 77 61 72 00 00 01 00 03 00 00 00 1e  vil war...
00b0 00 04 02 02 02 02 05 52 65 62 65 6c 0a 73 70 61  ....R ebel spa
00c0 63 65 73 68 69 70 73 00 00 01 00 03 00 00 00 1e  ceships.....
00d0 00 04 02 02 02 02 08 73 74 72 69 6b 69 6e 67 04  ....s triking
00e0 66 72 6f 6d 01 61 06 68 69 64 64 65 6e 04 62 61  from a h idden ba
00f0 73 65 00 00 01 00 03 00 00 00 1e 00 04 02 02 02  se.....
0100 02 04 68 61 76 65 03 77 6f 6e 05 74 68 65 69 72  ..have w on their
0110 05 66 69 72 73 74 07 76 69 63 74 6f 72 79 00 00  ..first v ictory
0120 01 00 03 00 00 00 1e 00 04 02 02 02 02 07 61 67  ....ag
0130 61 69 6e 73 74 03 74 68 65 64 65 76 69 6c 08 47  ainst the e evil G
0140 61 6c 61 63 74 69 63 06 45 6d 70 69 72 65 00 00  alactic Empire...
0150 01 00 03 00 00 00 1e 00 04 02 02 02 02 06 44 75  ....Du
0160 72 69 6e 67 03 74 68 65 06 62 61 74 74 6c 65 00  ring the battle
0170 00 01 00 03 00 00 00 1e 00 04 02 02 02 02 05 52  ....R
0180 65 62 65 6c 05 73 70 69 65 73 07 6d 61 6e 61 67  ebel spi es manag
0190 65 64 00 00 01 00 03 00 00 00 1e 00 04 02 02 02  ed
01a0 02 02 74 6f 05 73 74 65 61 6c 06 73 65 63 72 65  ..to ste al secre
01b0 74 05 70 6c 61 6e 73 00 6c 6f 6c 6c 6f 6c 6c 6f  t plans: lolllol
01c0 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c  llolloll lolllol
01d0 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c  lolllollo lollloll
01e0 6f 6c 6c 6f 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c  ollollol lolllollo
01f0 6c 6c 6f 6c
```



```
0000 02 00 00 00 45 00 01 f0 06 3f 00 00 80 11 00 00 .....E...?.....
0010 7f 00 00 01 7f 00 00 01 00 35 de 10 01 dc 30 cc .....5...0
0020 79 21 84 00 00 01 00 01 00 00 00 0b 07 72 61 6e .....y!.....ran
0030 64 6f 6d 38 03 69 72 6c 00 00 01 00 01 6c 6f 6e .....dom& irl...lol
0040 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6e .....lollo llo llo llo
0050 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6c 6f 6c 6f 6e .....lollo llo llo llo
0060 6c 6c 6f 6c 6c 6f 6c 00 00 00 1e 00 04 02 02 03 .....lollo llo llo llo
0070 02 01 41 03 4e 45 57 04 48 4f 50 45 00 00 01 00 .....A NEW HOPE...
0080 03 00 00 00 1e 00 04 02 02 02 02 02 49 74 02 69 .....It i
0090 73 01 61 06 70 65 72 69 6f 64 02 6f 66 05 63 69 .....s a peri od of ci
00a0 76 69 6c 03 77 61 72 00 00 01 00 03 00 00 00 1e .....vil war.....
00b0 00 04 02 02 02 02 05 52 65 62 65 6c 0a 73 70 61 .....Rebel spa
00c0 63 65 73 68 69 70 73 00 00 01 00 03 00 00 00 1e .....ceships.....
00d0 00 04 02 02 02 02 08 73 74 72 69 6b 69 6e 67 04 .....s triking
00e0 66 72 6f 6d 01 61 06 68 69 64 64 65 6e 04 62 61 .....from a h idden ba
00f0 73 65 00 00 01 00 03 00 00 00 1e 00 04 02 02 02 .....se.....
0100 02 04 68 61 76 65 03 77 6f 6e 05 74 68 65 69 72 .....have w on their
0110 05 66 69 72 73 74 07 76 69 63 74 6f 72 79 00 00 .....first v ictory..
0120 01 00 03 00 00 00 1e 00 04 02 02 02 07 61 67 .....tag
0130 61 69 6e 73 74 03 74 68 65 04 65 76 69 6c 08 47 .....ainst th e evil G
0140 61 6c 61 63 74 69 63 06 45 6d 70 69 72 65 00 00 .....alactic Empire..
0150 01 00 03 00 00 00 1e 00 04 02 02 02 06 44 75 .....Du
0160 72 69 6e 67 03 74 68 65 06 62 61 74 74 6c 65 00 .....ring the battle..
0170 00 01 00 03 00 00 00 1e 00 04 02 02 02 05 52 .....R
0180 65 62 65 6c 05 73 70 69 65 73 07 6d 61 6e 61 67 .....ebel spi es manag
0190 65 64 00 00 01 00 03 00 00 00 1e 00 04 02 02 02 .....ed.....
01a0 02 02 74 6f 05 73 74 65 61 6c 06 73 65 63 72 65 .....to ste al secre
01b0 74 05 70 6c 61 6e 73 00 00 01 00 03 00 00 00 1e .....t plans.....
01c0 00 04 02 02 02 02 02 74 6f 03 74 68 65 07 45 6d .....t o the Em
01d0 70 69 72 65 73 08 75 6c 74 69 6d 61 74 65 06 77 .....pires ul timate w
01e0 65 61 70 6f 6e 00 00 01 00 03 00 00 00 1e 00 04 .....eapon.....
01f0 02 02 02 02 .....
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