# Holiday Networking Challenge

*Connect to visual-networking.holidayhackchallenge.com step by step!*

*Help Santa deliver packets across the internet!*

## Challenge 1: DNS Lookup

Step one is to find the IP address of visual-networking.holidayhackchallenge.com. Let's use an IPv4 DNS request.

### Client

**DNS Request**

**Port:**

53

**Domain Name:**

visual-networking.holidayhac

**Request Type:**

A

### DNS Server

**DNS Response**

**Response Value:**

34.160.145.134

**Response Type:**

A

Submit DNS Resolution

Reset DNS Challenge

**Success! Correctly resolved DNS A record**

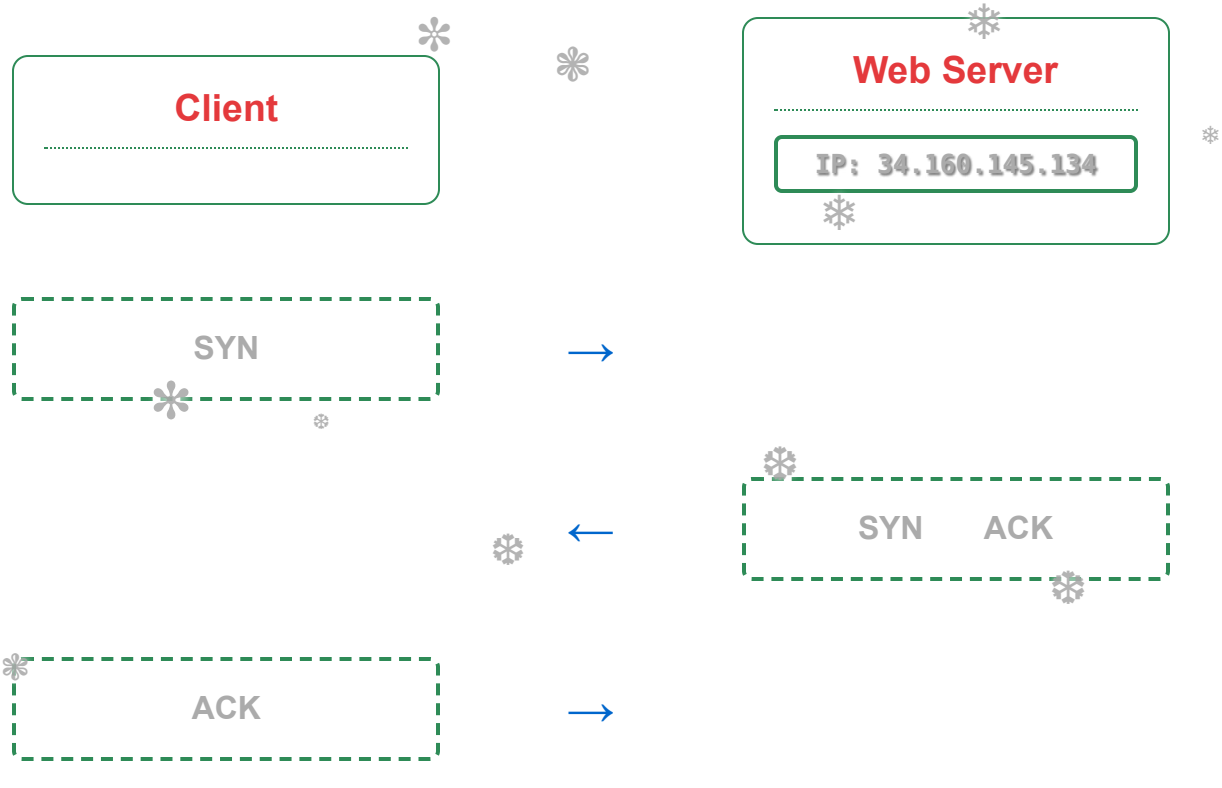
Request: A visual-networking.holidayhackchallenge.com via port 53

Response: A record with value 34.160.145.134

✓ DNS Challenge Complete!

## Challenge 2: TCP 3-Way Handshake

Now that we have the IP address of the web server, we need a TCP connection. Drag and drop TCP flags to create **TCP 3-way handshake** between client and server.




### TCP Flags

URG ACK PUSH RST SYN FIN

✓ TCP Handshake Complete!

Reset TCP Challenge

## Challenge 3: HTTP GET Request

Now that we have established a TCP connection, let's create an HTTP GET request to retrieve the web page.

### Client

**HTTP Request**

**HTTP Verb:**

GET

**HTTP Version:**

HTTP/1.1

**Host:**

visual-networking.holidayha…

**User-Agent:**

Enter User-Agent

### Web Server

**HTTP Response**

```
HTTP/1.1 302 Found

Location: https://visual-
networking.holidayhackchalle

Content-Type: text/html

Server: SANS-Holiday-Hack-
Challenge

Connection: keep-alive

<html><body>Redirecting to
HTTPS...</body></html>
```

Send HTTP Request

Reset HTTP Challenge

Success! Valid HTTP GET request sent.

Request: GET / HTTP/1.1

Host: visual-networking.holidayhackchallenge.com

User-Agent: Not provided

✓ **HTTP Challenge Complete!**

## Challenge 4: TLS Handshake

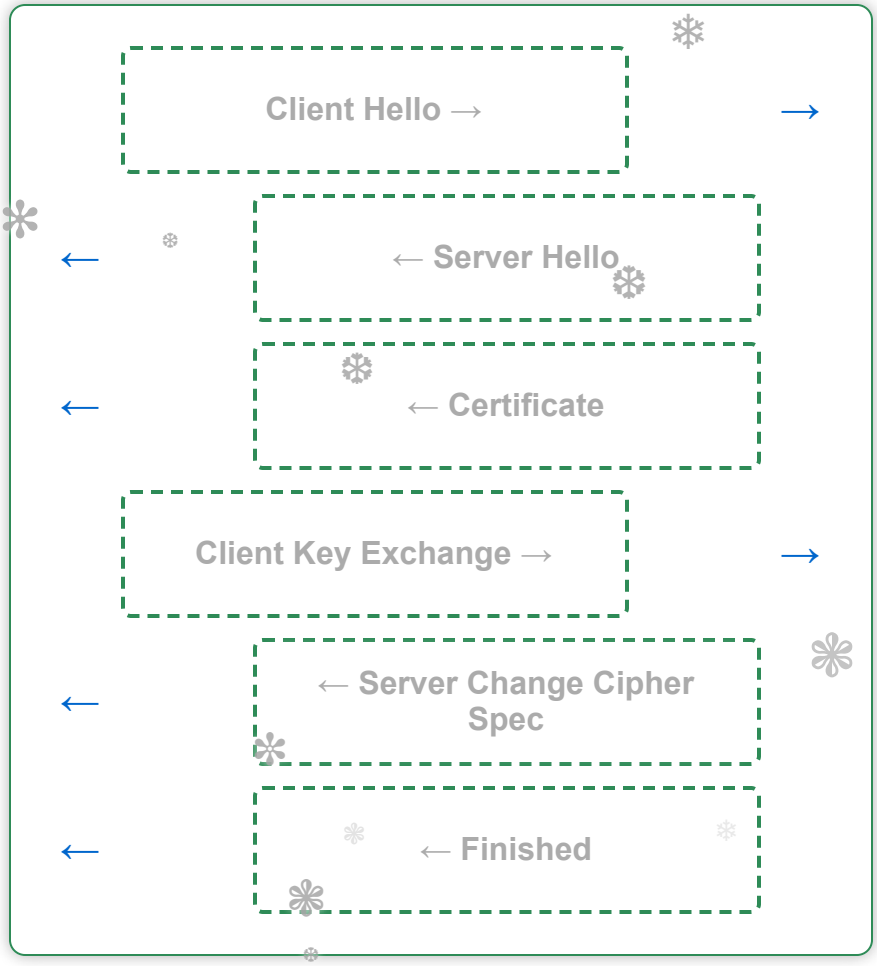
Great job with HTTP! Now let's set up a secure connection using TLS. Drag and drop the TLS messages to create the correct handshake sequence.

### Client

Connecting to: https://visual-networking.holidayhackchallenge.com

### Secure Web Server 🔒

https://visual-networking.holidayhackchallenge.com



### TLS Messages

Client Hello →

← Server Hello

← Certificate

Client Key Exchange →

← Server Change Cipher Spec

← Finished

✓ TLS Handshake Complete!

Reset TLS Challenge

Success! You've correctly established a secure TLS connection.

The TLS handshake creates a secure encrypted tunnel for HTTP traffic:

1. Client Hello: Client initiates secure connection with supported cipher suites
2. Server Hello: Server responds with selected cipher suite
3. Certificate: Server sends its SSL/TLS certificate
4. Client Key Exchange: Client sends parameters for shared secret calculation
5. Server Change Cipher Spec: Server indicates messages will be encrypted
6. Finished: Server confirms handshake completion

✓ TLS Challenge Complete!

## Challenge 5: HTTPS GET Request

Now that we've established a secure TLS connection, let's make an HTTPS request to retrieve the website securely.

## Client

### HTTPS Request

**HTTP Verb:**

GET

**HTTP Version:**

HTTP/1.1

**Host:**

visual-networking.holidayhac…

**User-Agent:**

Enter User-Agent

## Secure Web Server 🔒

### HTTPS Response

```
HTTP/1.1 200 OK

Content-Type: text/html

Server: SANS-Holiday-
Hack-Challenge

Connection: keep-alive

Secure-Connection:
established
```

---

```
<!DOCTYPE html>

<html>

<head>

  <title>Holiday Hack
Challenge 2024</title>

  <meta charset="UTF-8">

  <meta name="viewport"
content="width=device-
width, initial-
scale=1.0">

</head>

<body>

  ... website content ...

</body>

</html>
```


Send HTTPS Request

Reset HTTPS Challenge

Success! Valid HTTPS GET request sent.

Request: GET / HTTP/1.1

Host: visual-networking.holidayhackchallenge.com

User-Agent: Not provided

✓ **HTTPS Challenge Complete!**

## Victory!

Congratulations, you've completed the challenge!

🎅 **HO HO HO! You've mastered networking!** 🎅

**All challenges completed with holiday cheer!**

🎄 **Your success has been reported to the North Pole!** 🎄

Holiday Networking Challenge - SANS Holiday Hack Challenge