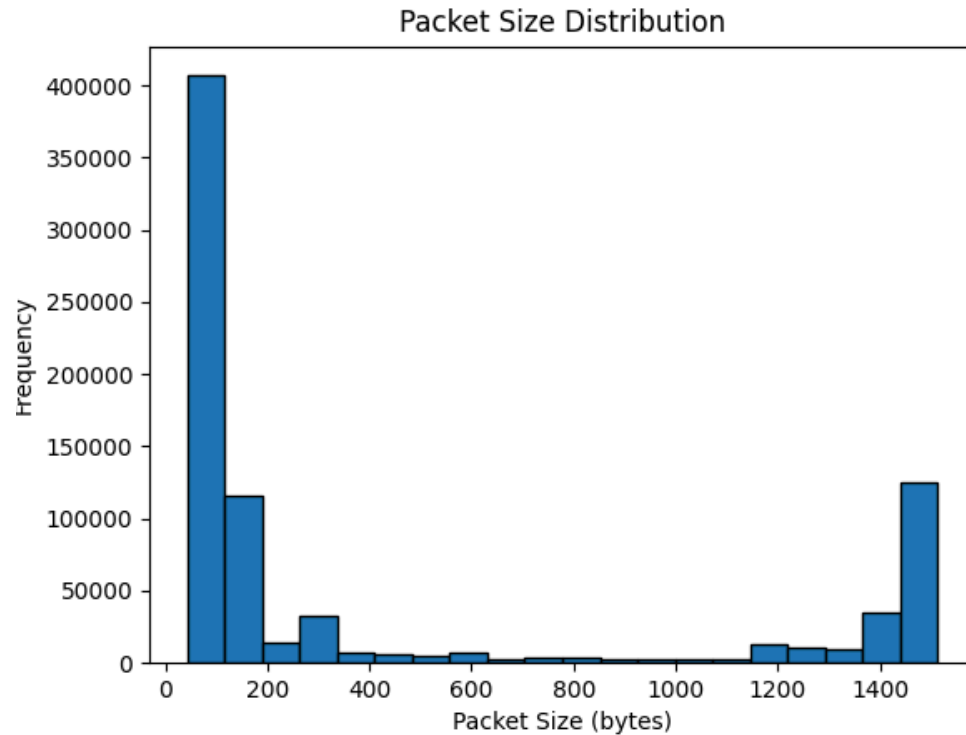# Computer Networks

Part 1:

Data and Packet Metrics

- **Total Data Transferred: 34194641 bytes**
- **Total Packets Transferred: 120713**
- **Min Packet Size: 42, Max Packet Size: 7354, Avg Packet Size: 283.27**

Maximum Packet Details

- **Largest Data Transfer:**
- **Source: 174.129.24.9, Destination: 172.16.133.39, Bytes Transferred: 2000498**

Packet Size Distribution

Part 2:

Q1: Extracting the IP Address from a TCP Packet

The IP address found in the TCP packet containing the message "< my ip address = >" is:
 10.1.2.200

Q2: Counting Packets with the Identified IP Address

The total number of packets that contain the IP address **10.1.2.200** is:
 80 packets

Q3: Extracting Laptop Name and TCP Checksum

(a) **Laptop Name Found in a TCP Packet:**
 lenovo

(b) **TCP Checksum of the Packet Containing the Laptop Name:**
 0x0a61

Q4: Counting Packets Containing "Order successful"

The total number of packets that contain the message "**Order successful**" is:
 40 packets

Part 3: Capture the packets

1)

 Syslog Protocol

- **Operation:** Syslog is used for message logging, allowing devices such as routers, switches, and servers to send log messages to a central server for monitoring and debugging.
- **Layer:** Application Layer
- **RFC:** RFC 5424

LDAP (Lightweight Directory Access Protocol)

- **Operation:** LDAP is used for querying and modifying directory services, commonly used for authentication and centralized user management in enterprise networks.
- **Layer:** Application Layer

- **RFC:** RFC 4519

NNTP (Network News Transfer Protocol)

- **Operation:** NNTP is used to distribute, retrieve, and post news articles (Usenet newsgroups) over the Internet. It is mainly used for online discussion forums.
- **Layer:** Application Layer
- **RFC:** RFC 3977

BGP (Border Gateway Protocol)

- **Operation:** BGP is used for exchanging routing information between autonomous systems (AS) on the Internet. It is essential for global Internet routing.
- **Layer:** Application Layer
- **RFC:** RFC 4271

SMTP (Simple Mail Transfer Protocol)

- **Operation:** SMTP is used for sending and forwarding email messages between mail servers. It operates on a push model, meaning emails are sent from a client to a mail server and then relayed to the recipient's server. SMTP works alongside protocols like IMAP and POP3 for email retrieval.
- **Layer:** Application Layer
- **RFC:** RFC 5321

2)

Netflix

- **IP Address:** 54.74.73.31:443
- **Request Line:** GET / HTTP/2
- **Response Headers:**
    - accept-ch: Sec-CH-UA-Platform-Version,Sec-CH-UA-Model
    - cache-control: no-cache, no-store
    - content-security-policy-report-only: Specifies security policies for content sources.
- **Request Headers:**
    - accept: Various MIME types accepted, including HTML, images, and application data.
    - accept-encoding: Supports compression formats like gzip, deflate, and br.
    - accept-language: en-US,en;q=0.9
- **Connection: Not Persistent**

GitHub

- **IP Address:** 20.207.73.82:443

- **Request Line:** GET / HTTP/2
- **Response Headers:**
  - content-type: text/html; charset=utf-8
  - date: Sat, 01 Feb 2025 15:51:54 GMT
  - etag: W/"59eb3c5ca3c41c4bf99e43c360a81bef"
- **Request Headers:**
  - accept: Similar to Netflix, allowing multiple MIME types.
  - accept-encoding: Supports gzip, deflate, br, and zstd.
  - accept-language: en-US,en;q=0.9
- **Connection: Not Persistent**

Canara Bank

- **IP Address:** 107.162.160.8:443
- **Request Line:** GET / HTTP/1.1
- **Response Headers:**
  - connection: close
  - content-security-policy: Defines security rules for scripts, styles, and images.
  - content-type: text/html; charset=utf-8
- **Request Headers:**
  - accept: Accepts various content types, similar to Netflix and GitHub.
  - accept-encoding: Supports gzip, deflate, br, and zstd.
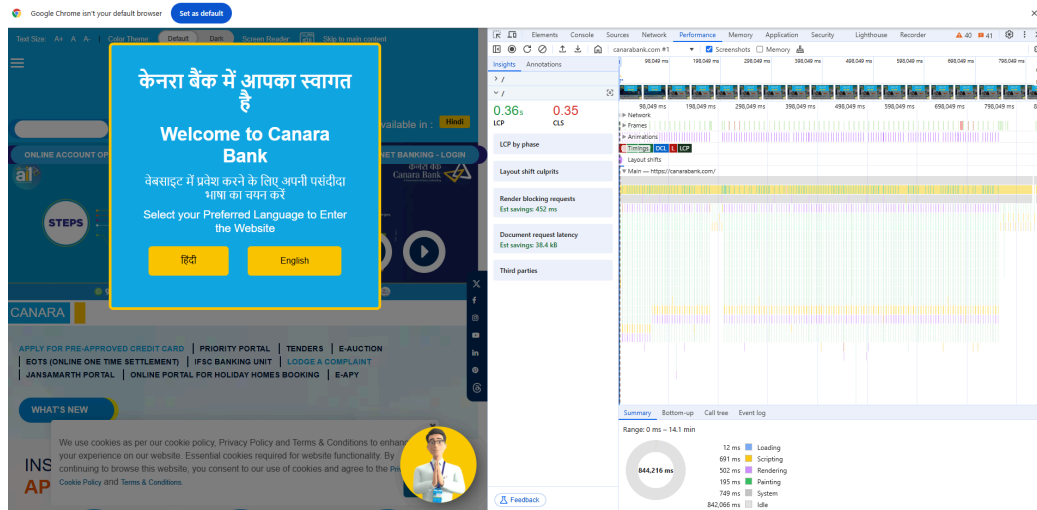 - accept-language: en-US,en;q=0.9
- **Connection: Persistent**

We are not encountering any HTTP error codes, but this could potentially be the error.

1. 404 Not Found:
   - The server cannot find the requested page. This error occurs when the URL does not point to a valid resource on the server.
2. 500 Internal Server Error:
   - The server encountered an unexpected condition that prevented it from fulfilling the request. This error is often due to issues within the server's code or configuration.
3. 403 Forbidden:
   - The server understands the request but refuses to authorize it. This can happen if the user doesn't have permission to access the requested resource.

3)

Browser : Chrome

screenshot of the performance metrics for canara bank

For Netflix:

The associated flags for the given cookie are:

1. **Max-Age=10800**: This indicates that the cookie will expire after 10,800 seconds (or 3 hours).
2. **Domain=.netflix.com**: The cookie is valid for any subdomain of netflix.com.

3. **Path=/**: The cookie is valid for the entire domain (i.e., all paths within the domain)