# Course: CSCI 651
# Project 6: Domain Name System


## Team Members

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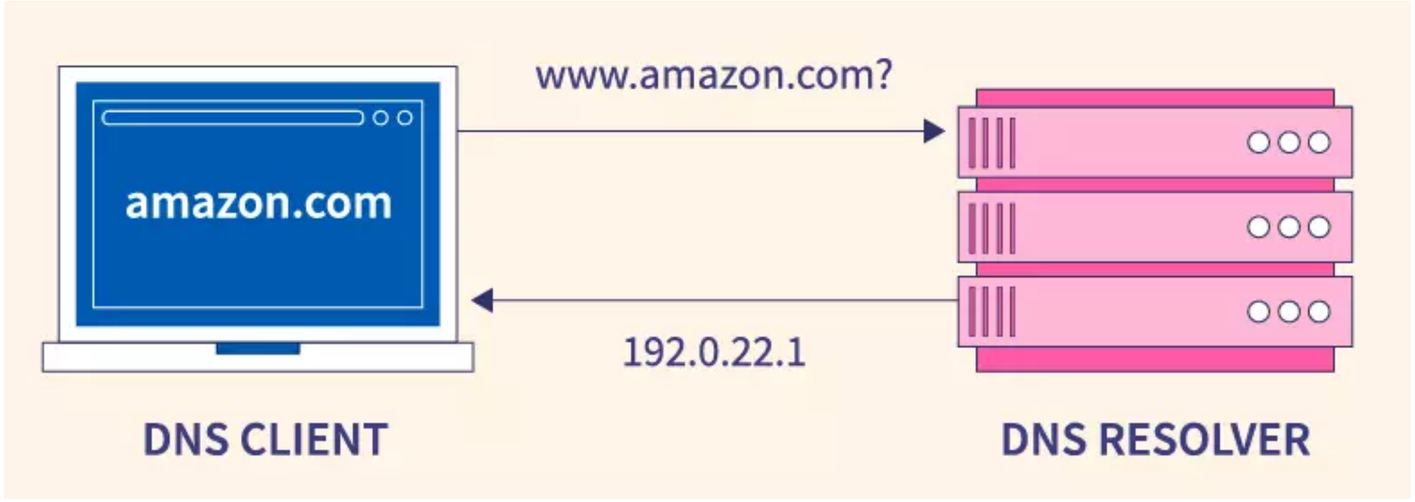
# DNS ?

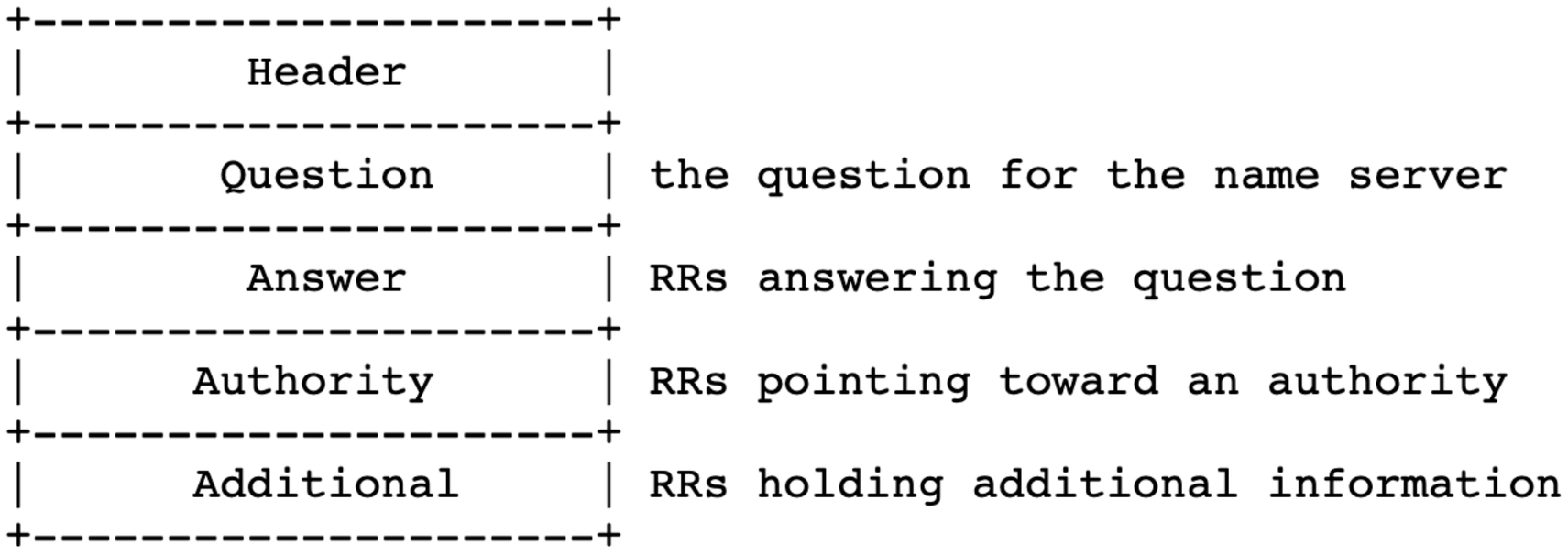




Source: google.com

# Working

- A system used to convert a computer's host name into an IP address on the Internet
- Its like a phonebook for our host to connect to different websites
- Example DNS server: google(8.8.8.8), cloudfare(1.1.1.1)

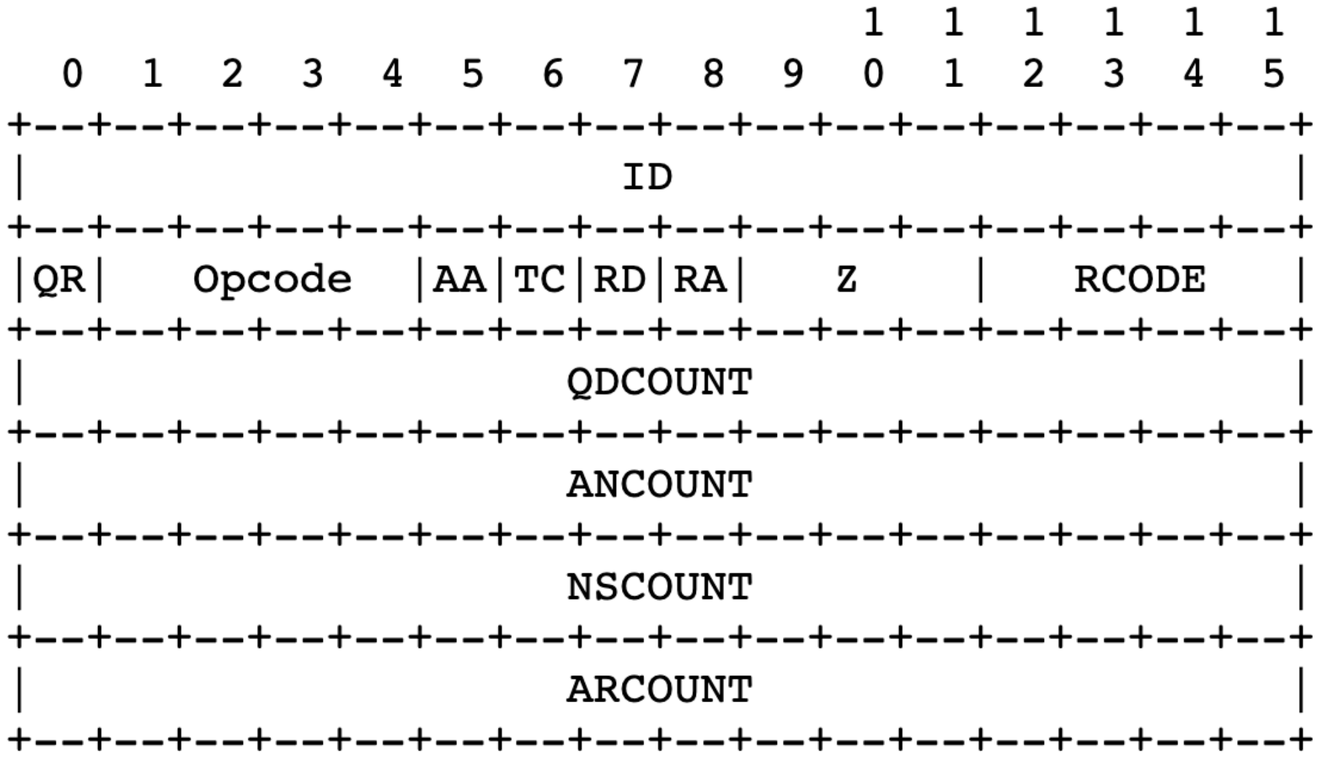
# DNS Packet Structure



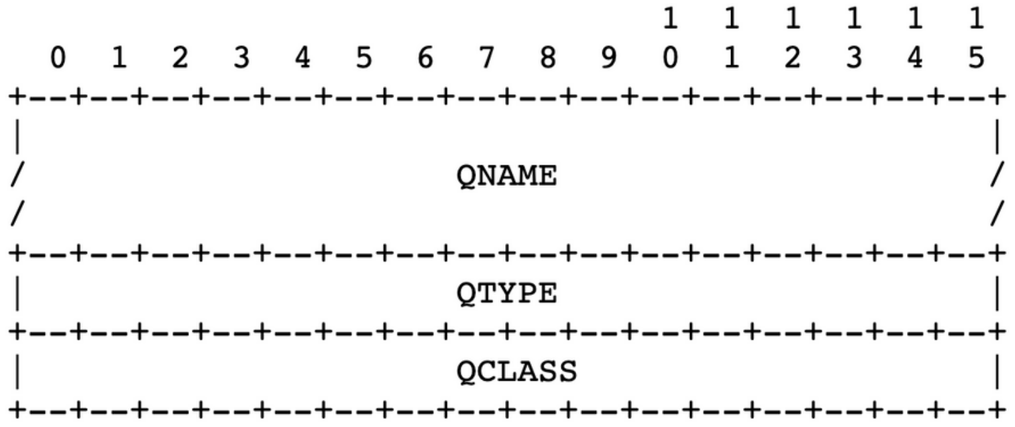

Source: RFC 1035

# DNS Structure

Header Format:

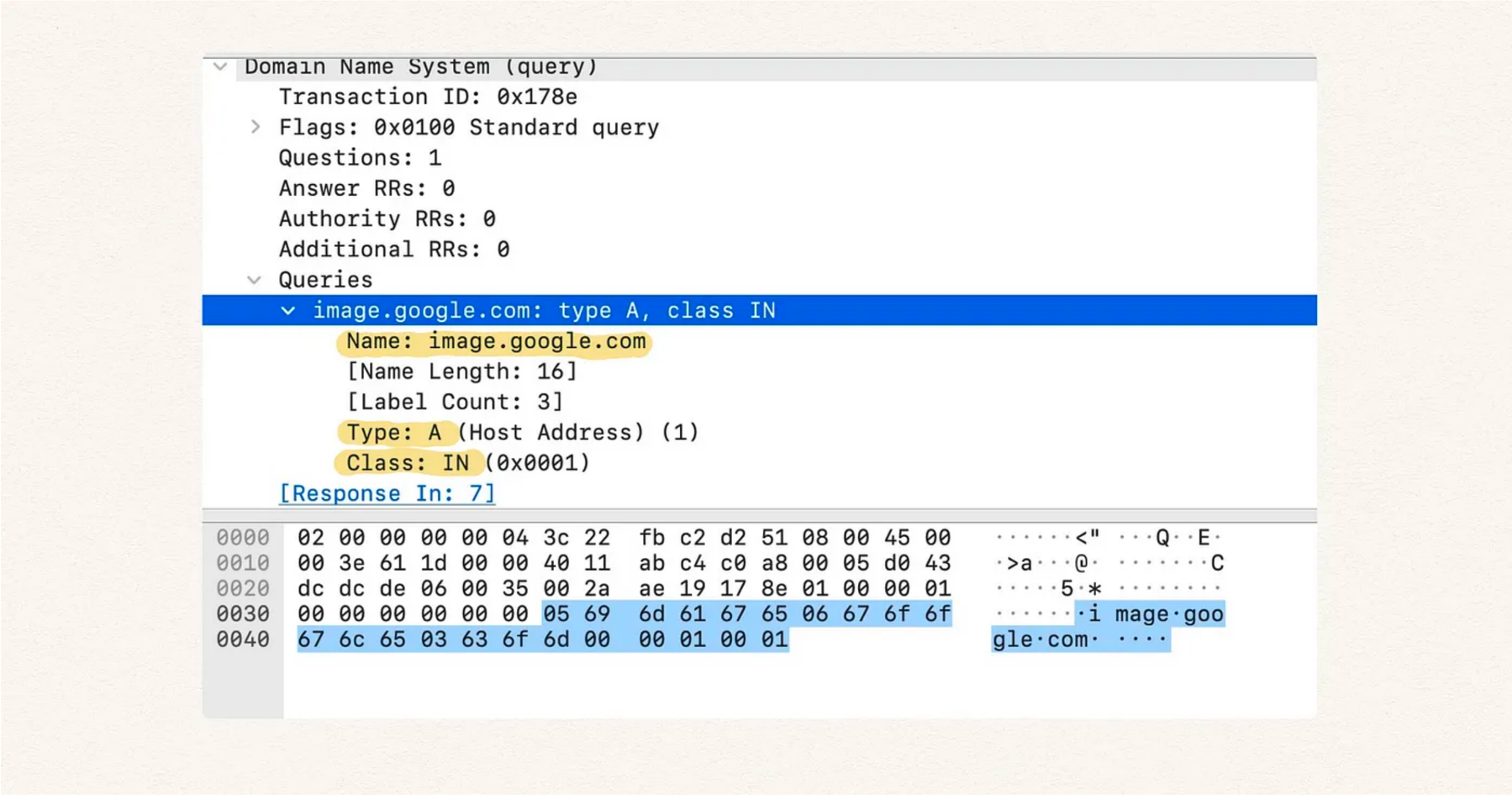



Query Format:



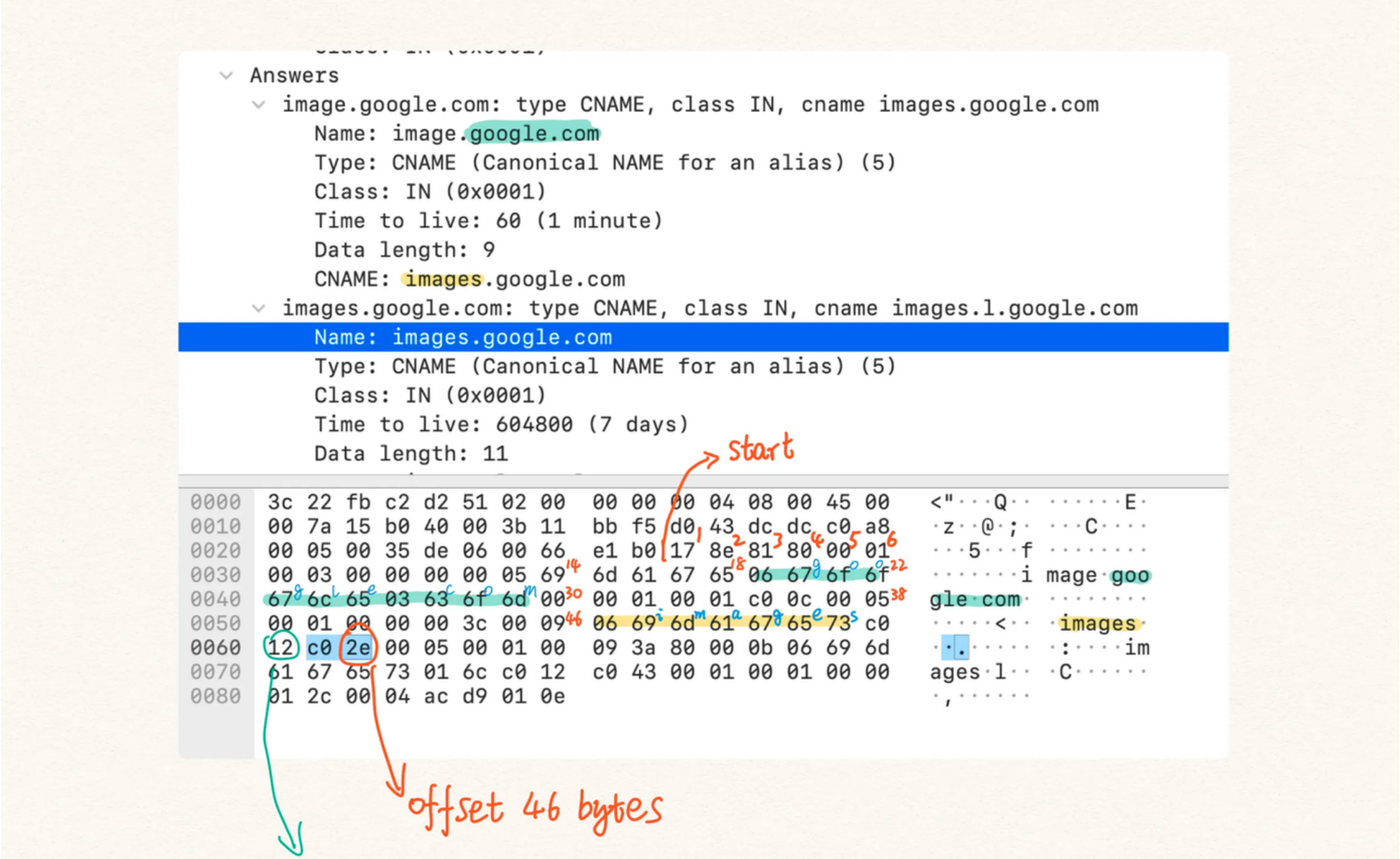

Source: RFC 1035

# DNS Structure




Source: medium.com/dns-message-how-to-read-query-and-response-message

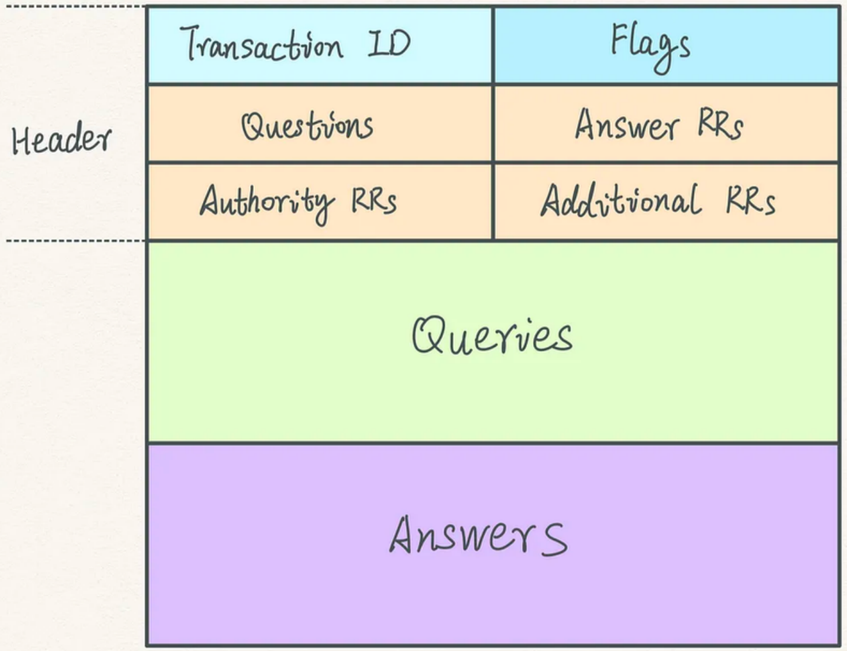
# Label Compression

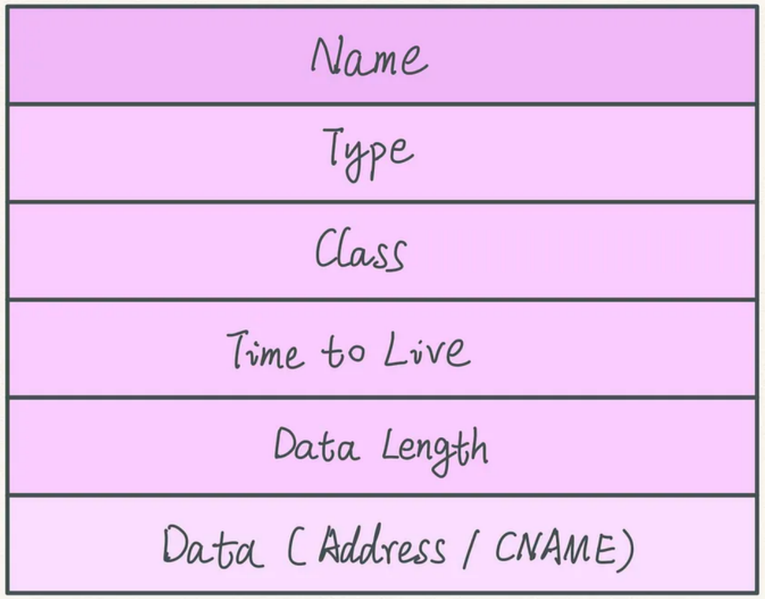



Source: medium.com/dns-message-how-to-read-query-and-response-message

# DNS Structure

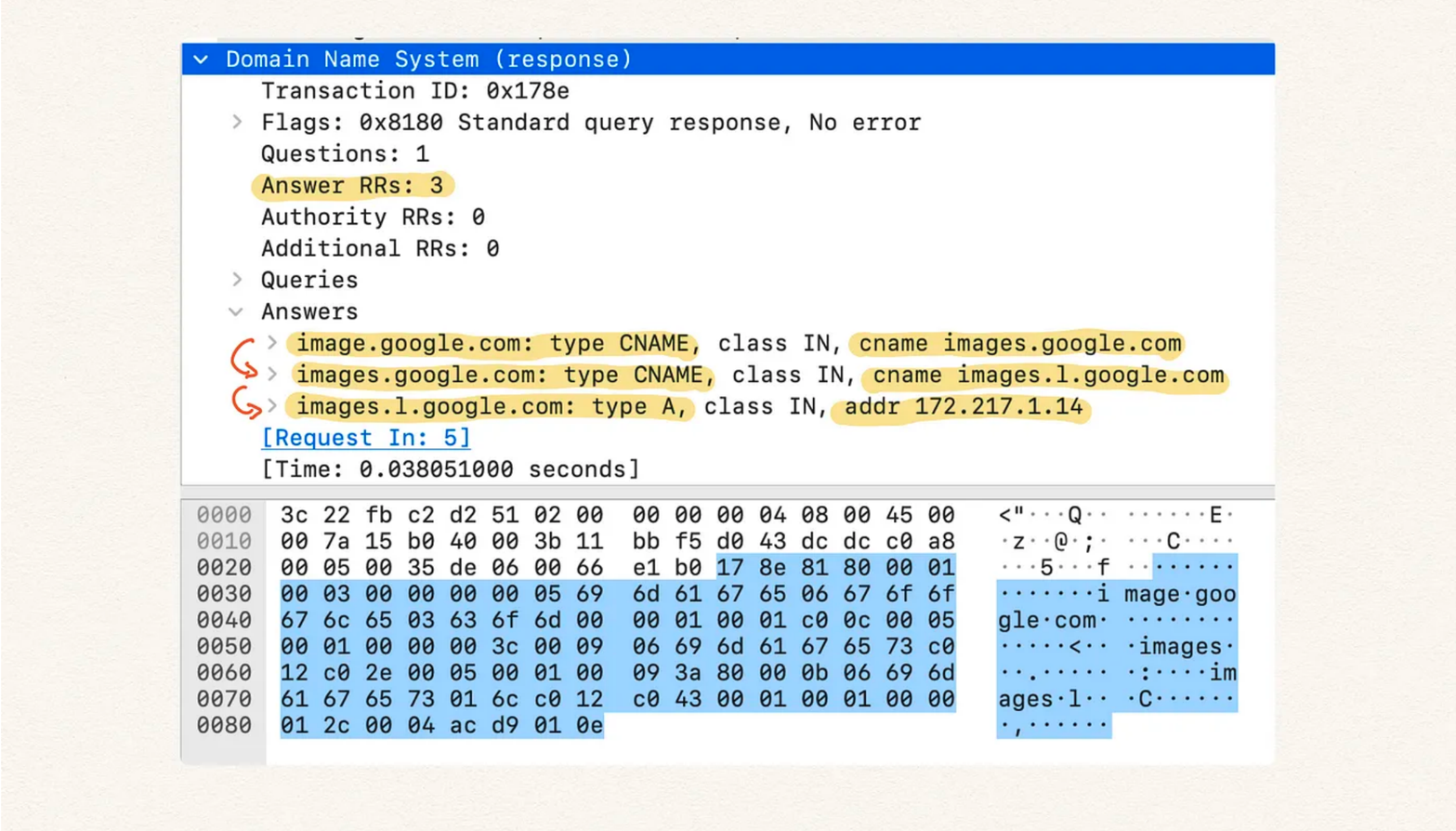
Response Message



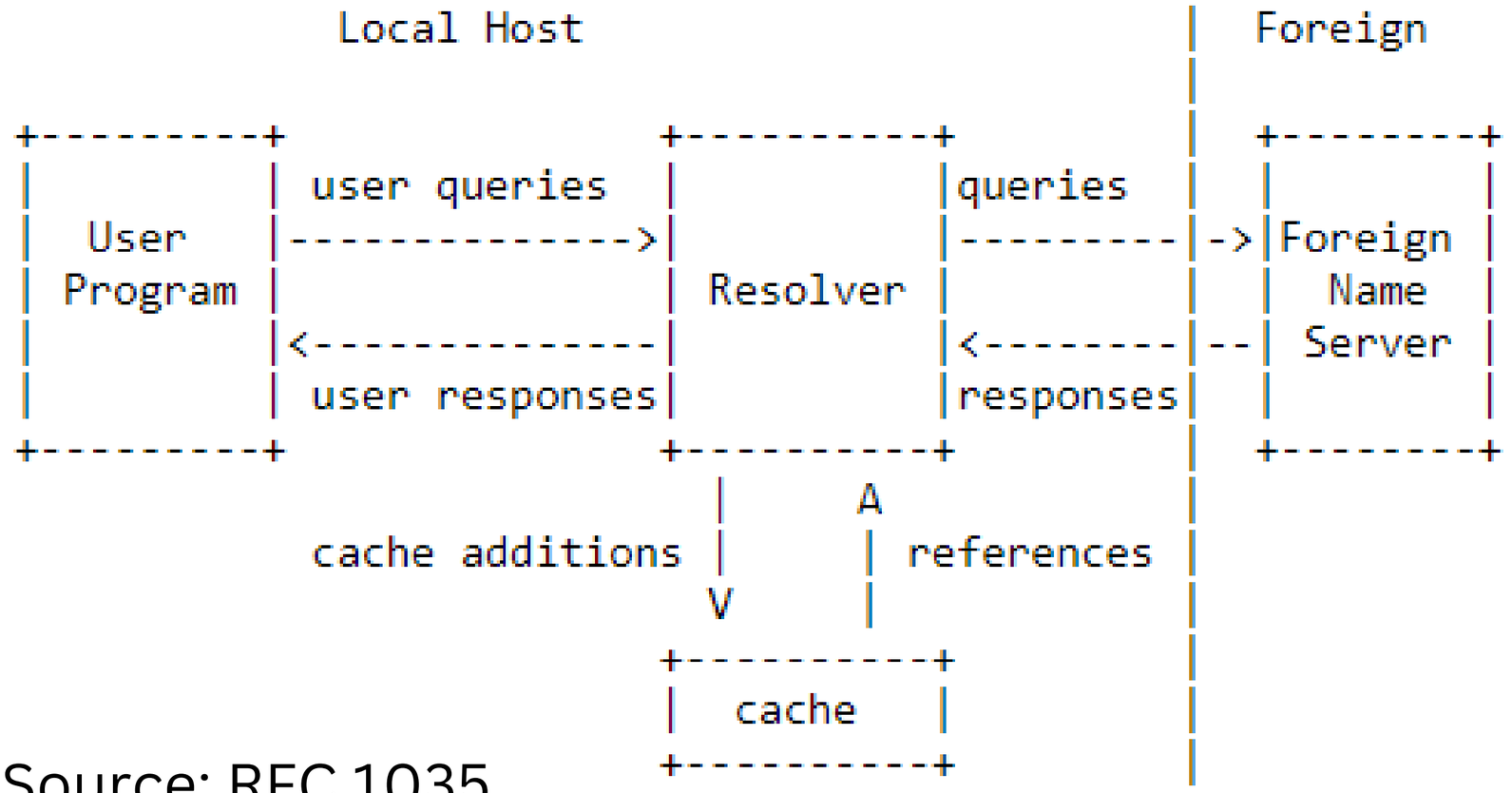

Source: medium.com/dns-message-how-to-read-query-and-response-message

# DNS Structure




Source: medium.com/dns-message-how-to-read-query-and-response-message

# Components of DNS




Source: RFC 1035

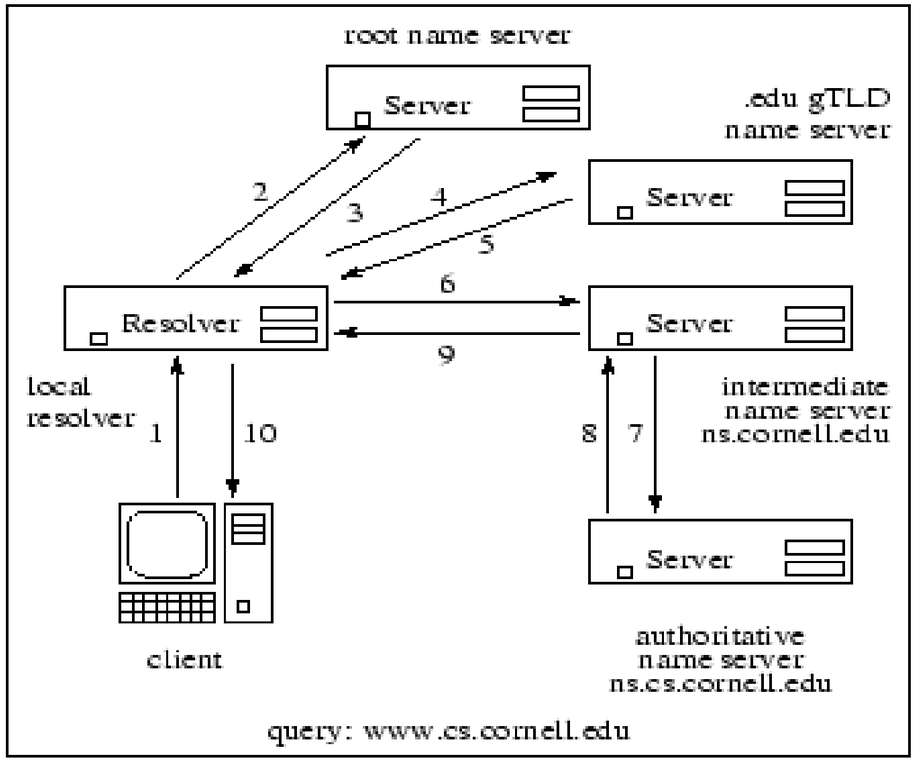
# Client Implementation

- The client is an interactive terminal that can take in the input from the user for query types A and CNAME
- Recursion desired from the server can be set by the user as well
- The client then makes a function call with the domain name and query type and recursion flag to the resolver
- The return value from the resolver is then stored and displayed as output for the particular query made.

# Implementation
# Resolver
# Contents

# RESOLVER

## Iterative DNS Query




Source: cs.cornell.edu

Domain: edu
Server: k.root-servers.net

Domain: cornell.edu
Server: a.edu-servers.net

Domain: cs.cornell.edu
Server: bigred.cit.cornell.edu

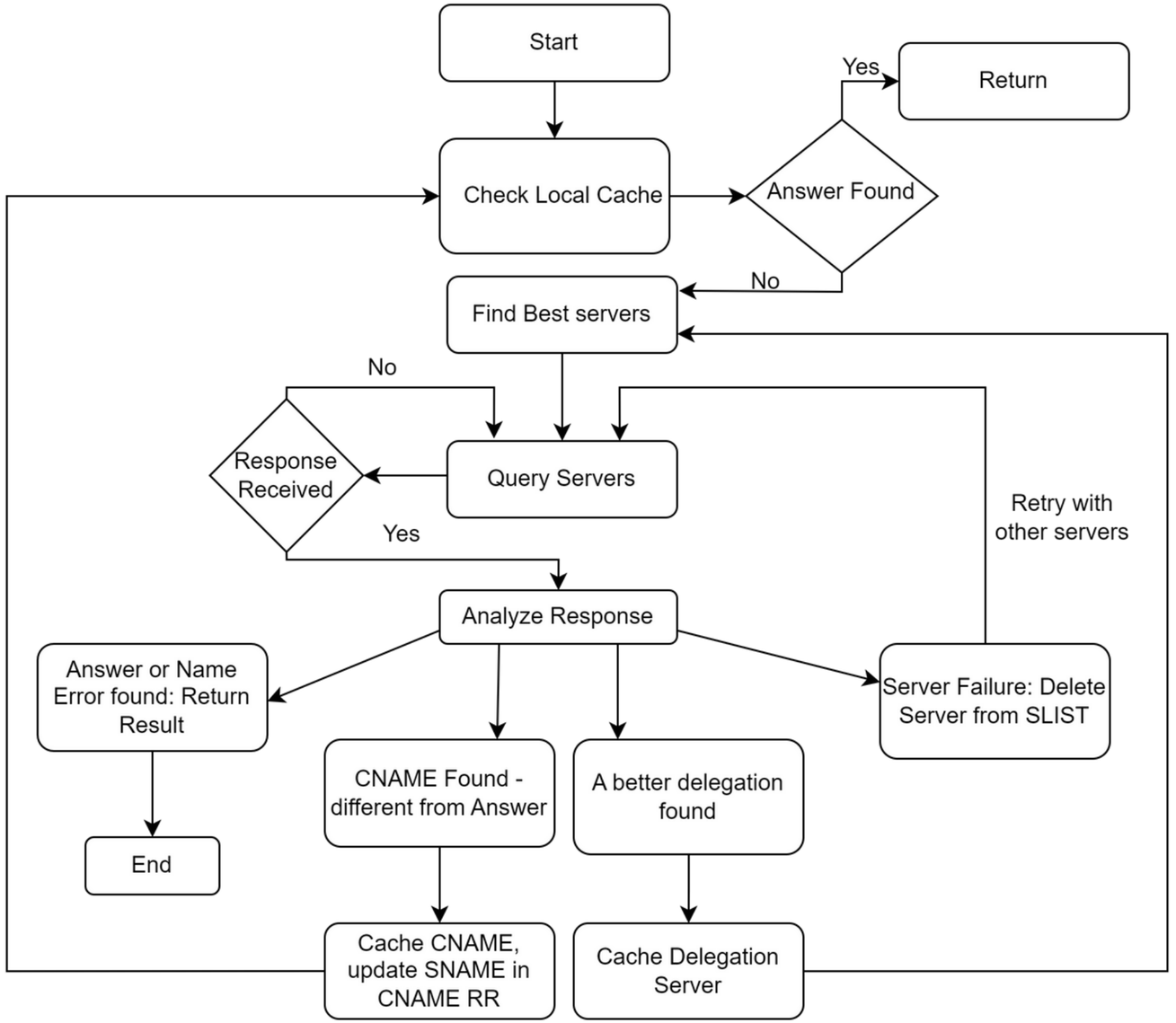
Domain: www.cs.cornell.edu
Server: bigred.cit.cornell.edu

Answers:
Name: www.cs.cornell.edu
Type: CNAME
Class: 1
TTL: 86400
Server: web1.cs.cornell.edu

Name: web1.cs.cornell.edu
Type: A
Class: 1
TTL: 300
Server: 132.236.207.36

# RESOLVER ALGORITHM

**Based on RFC 1034**

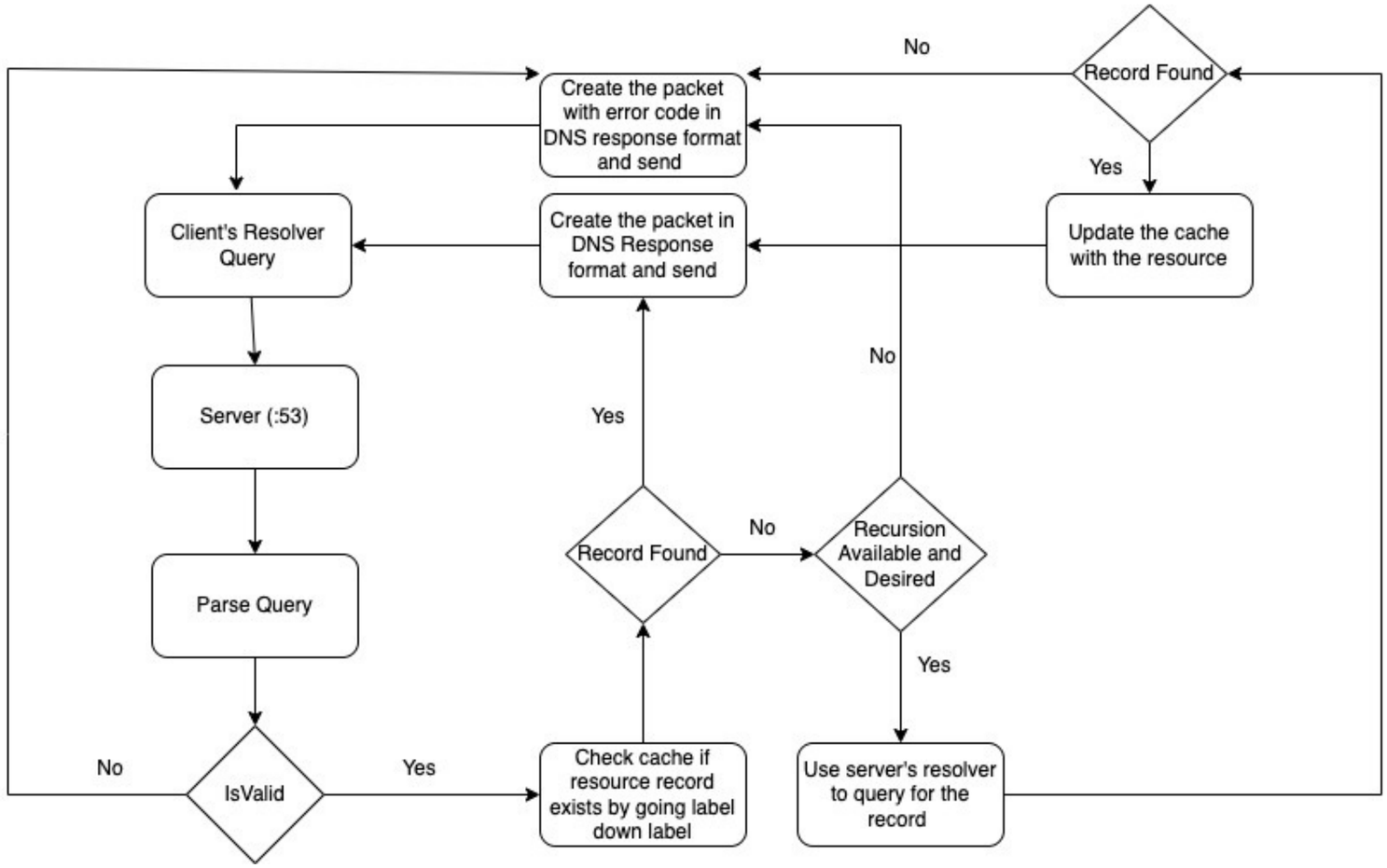


# Server Implementation

The DNS responses are sent as UDP packets

In case of invalid domain name, response with error code 3 indicating NXDOMAIN is set in the header and sent to the client.

Server Algorithm: RFC 1034



# DEMO


Thank you!

# Do you have any questions?

We hope you learnt something new.