

# TDC 375

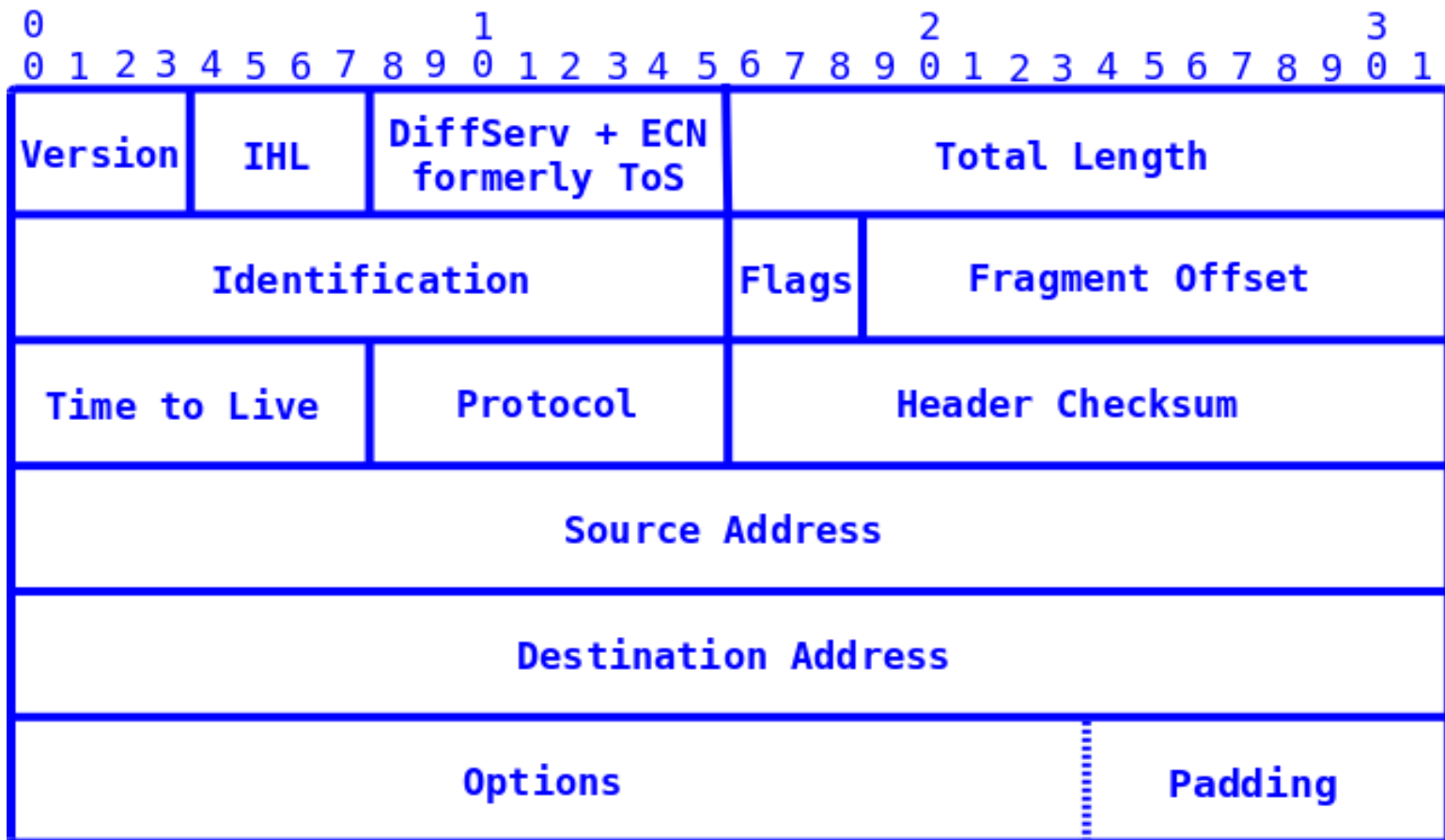
# Network Protocols

## TCP/IP Suite Overview

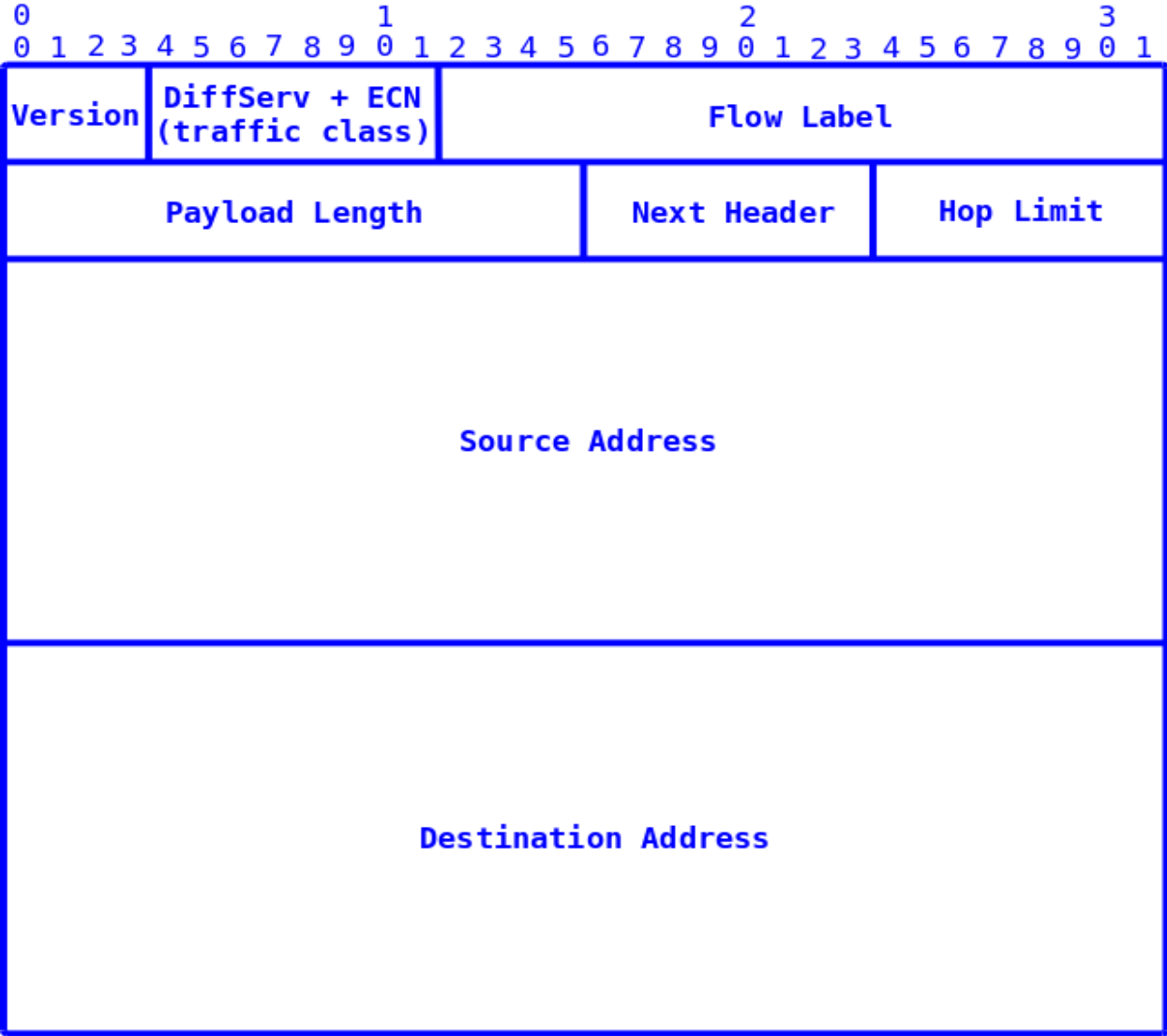
# Internet Standards Publications

- Internet-Drafts
- RFCs
  - Proposed, Draft or Internet Standard
  - Informational
  - Historical
  - Experimental
  - Best Common Practice (BCP)
  - For Your Information (FYI)

# IPv4



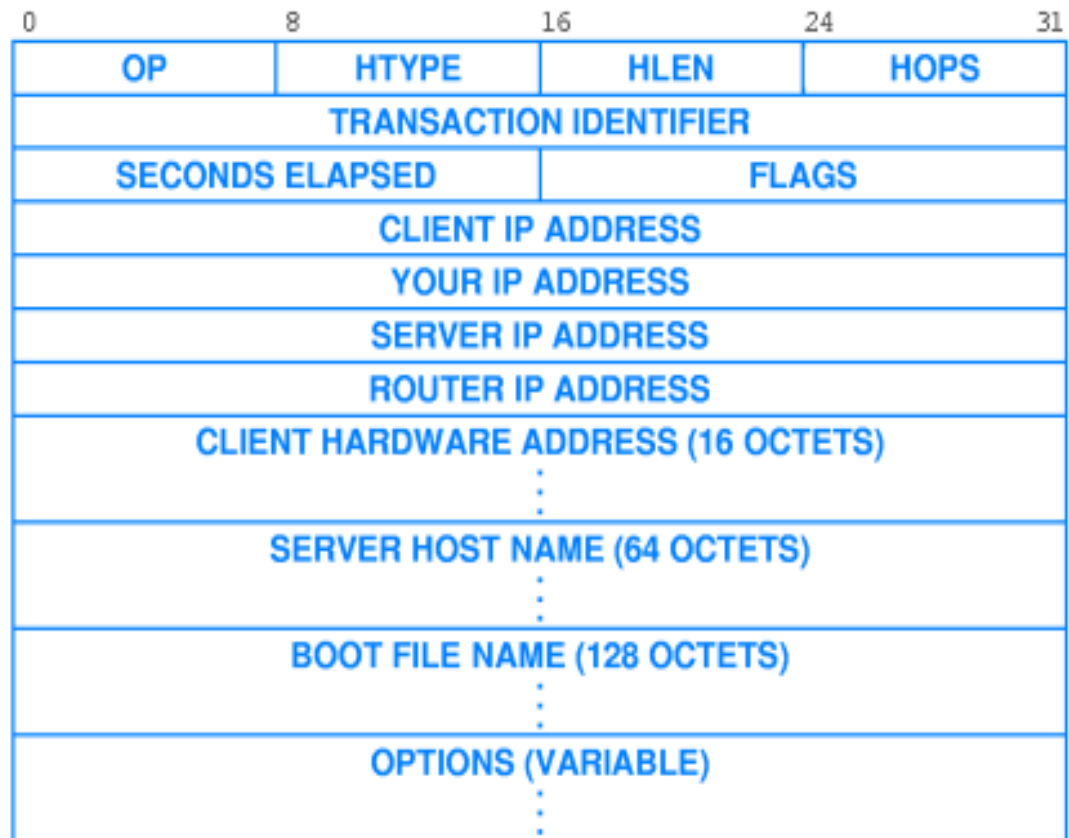
# IPv6



# ARP

0	8	16	24	31
<b>HARDWARE ADDRESS TYPE</b>		<b>PROTOCOL ADDRESS TYPE</b>		
<b>HADDR LEN</b>	<b>PADDR LEN</b>	<b>OPERATION</b>		
<b>SENDER HADDR (first 4 octets)</b>				
<b>SENDER HADDR (last 2 octets)</b>		<b>SENDER PADDR (first 2 octets)</b>		
<b>SENDER PADDR (last 2 octets)</b>		<b>TARGET HADDR (first 2 octets)</b>		
<b>TARGET HADDR (last 4 octets)</b>				
<b>TARGET PADDR (all 4 octets)</b>				

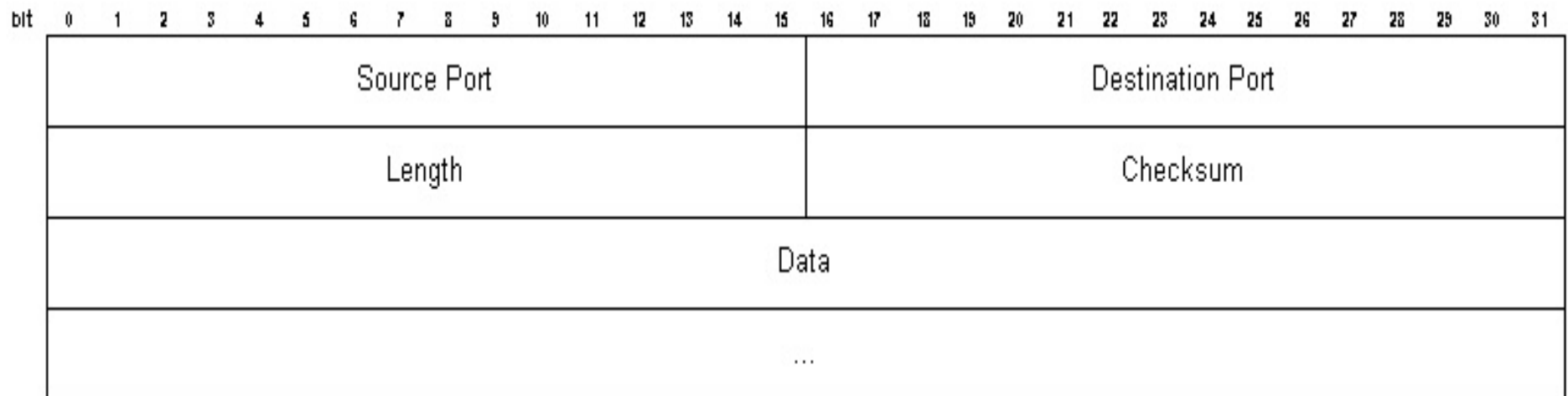
# DHCP



# ICMP

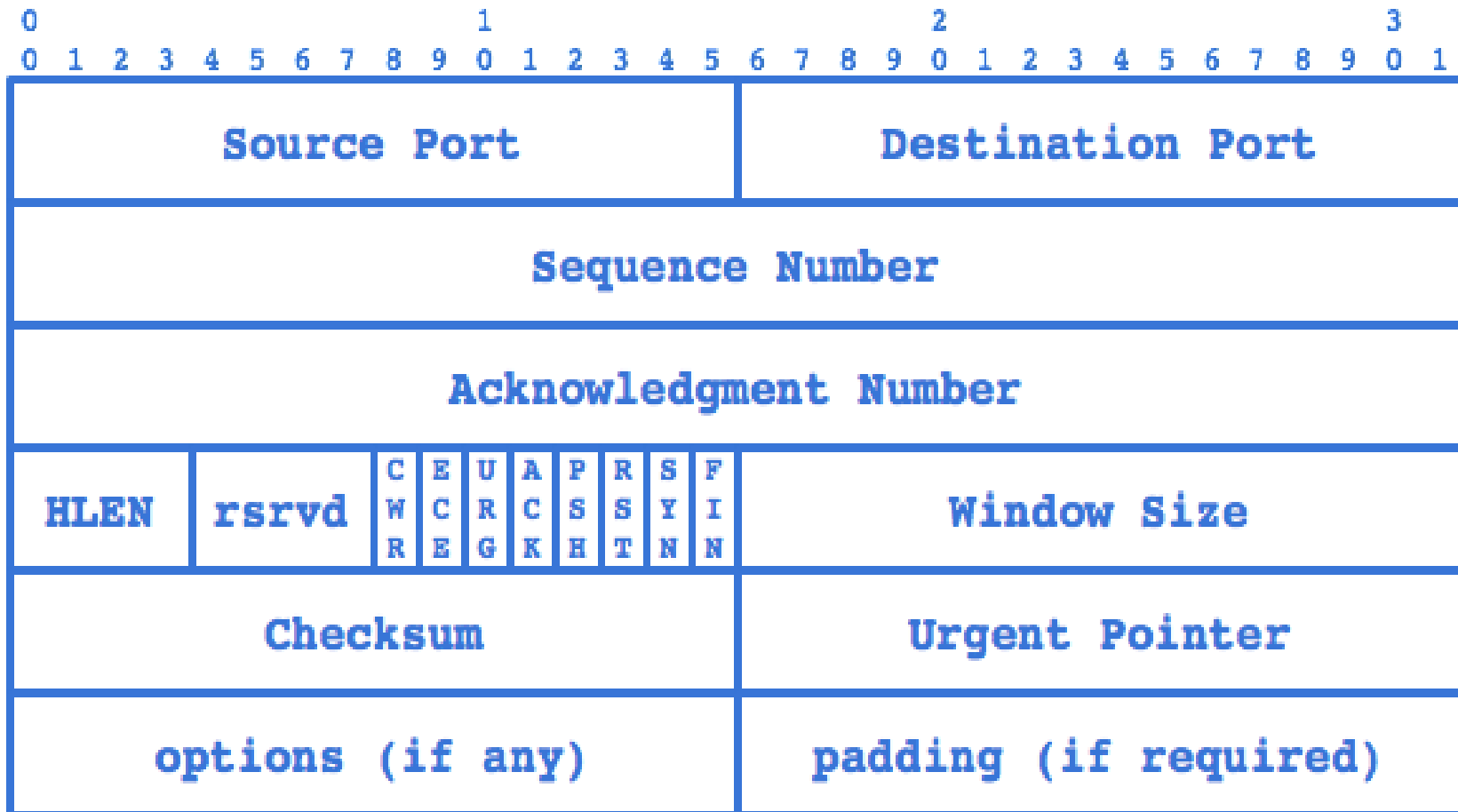
- Primarily used for error and status messages
- All ICMP messages have 3 common fields:  
TYPE, CODE, CHECKSUM
- Otherwise ICMP messages can vary widely
- Common uses
  - ICMP ECHO Request (aka PING)
  - Destination unreachable (e.g. PMTU discovery)

# UDP





# TCP



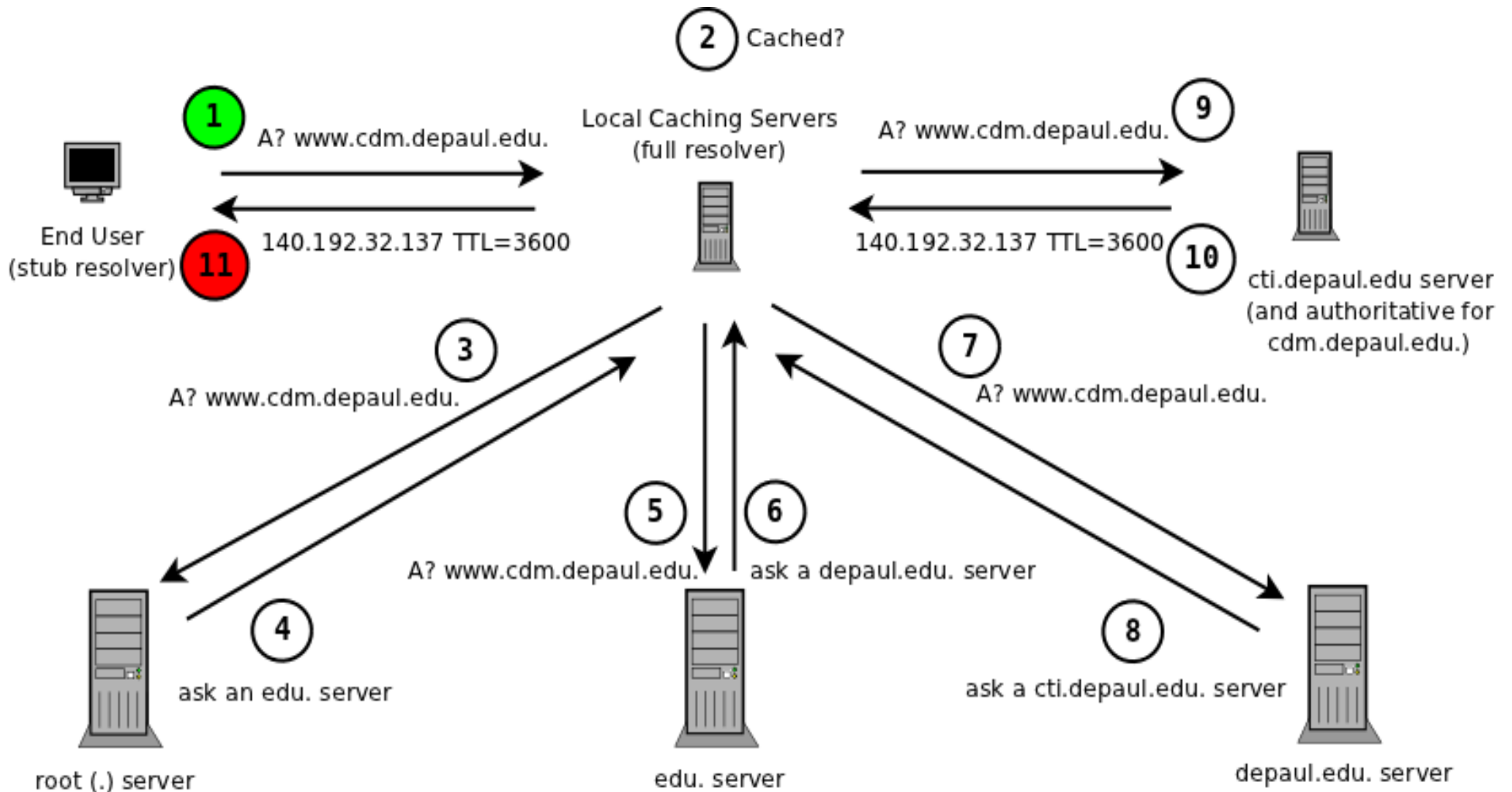
# Routing Protocols

- RIP
- OSPF
- IS-IS
- IGRP/EIGRP
- BGP

# IP Multicast

- Senders address packets to a group address
  - i.e. 224.0.0.0/4 in IPv4
- Never a source from a multicast address
- IGMP to manage group membership in IPv4
  - MLD, subset of ICMPv6 in IPv6
- Routers forward to where there are group members
- IP multicast routers maintain significant “state”

# DNS



# Applications, Management and Security

- SMTP, POP, IMAP
- TELNET, SSH
- TFTP, FTP, SCP, SFTP
- HTTP, HTTPS
- SSL/TLS
- syslog, SNMP, NetFlow, NETCONF
- NTP
- RADIUS / TACACS

## ...and many more

- For a sample, see:
  - Internet protocols (IP) /etc/protocols
  - Network applications (TCP/UDP) /etc/services