

# ***Lesson 9: Configuring Basic Networking***

# *Objectives covered*

- *109.1 Fundamentals of internet protocols (weight: 4)*
- *109.2 Persistent network configuration (weight: 4)*
- *109.4 Configure client side DNS (weight: 2)*
- *109.3 Basic network troubleshooting (weight: 4)*

# *Fundamentals of internet protocols*

# OSI and TCP/IP Model

Application

Presentation

Session

Transport

Network

Datalink

Physical

**OSI Model**

Application

Transport

Internet

Network Access

**TCP/IP Model - 4  
layers (Original)**

Application

Transport

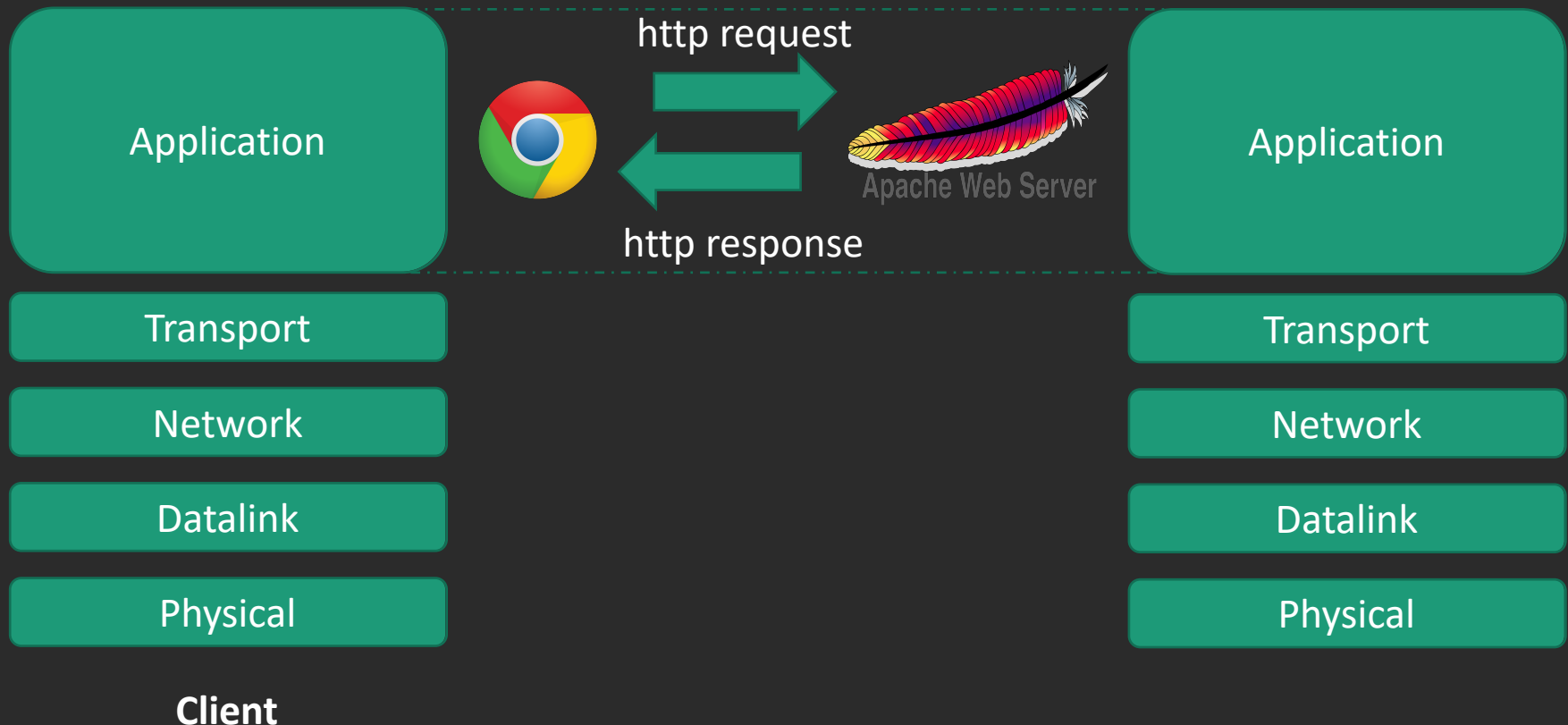
Network

Datalink

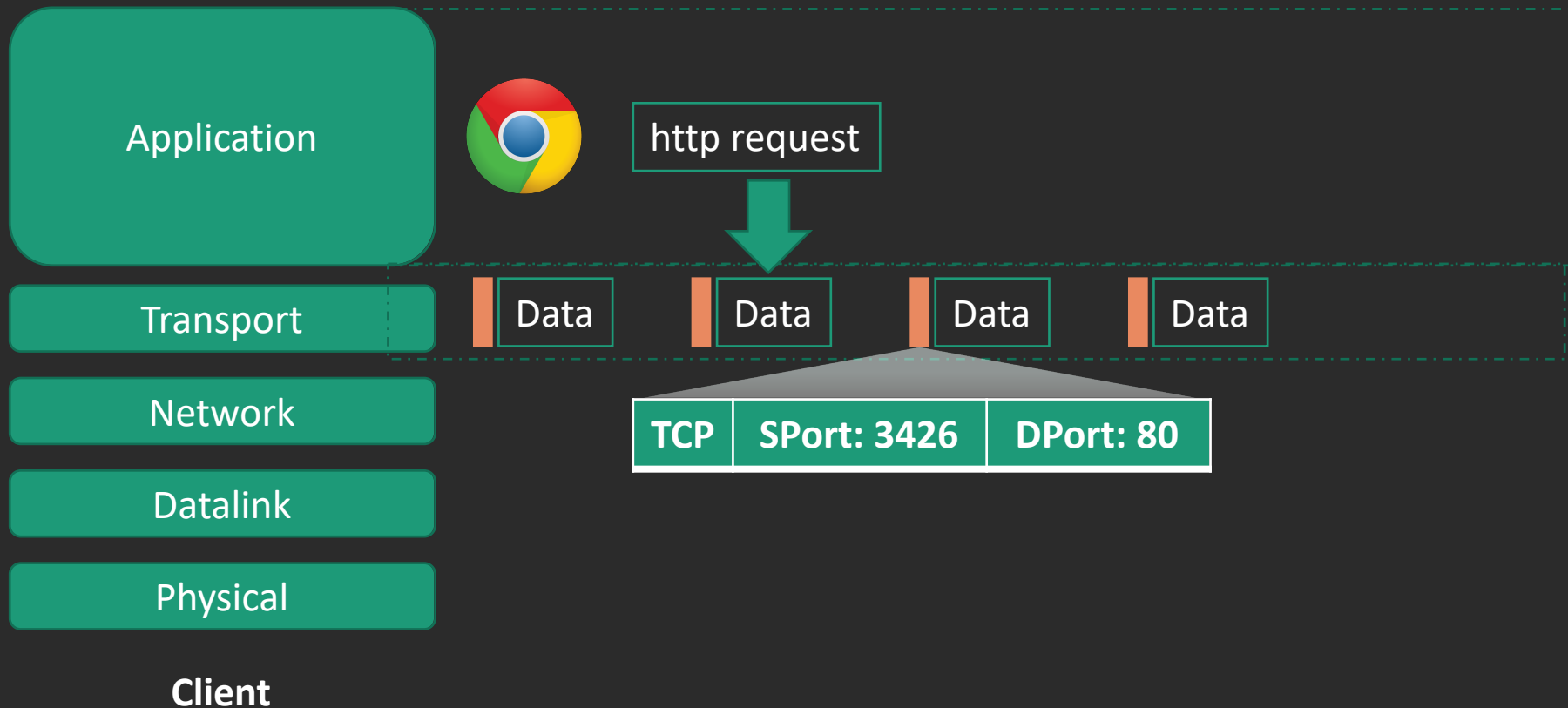
Physical

**TCP/IP Model – 5  
layers**

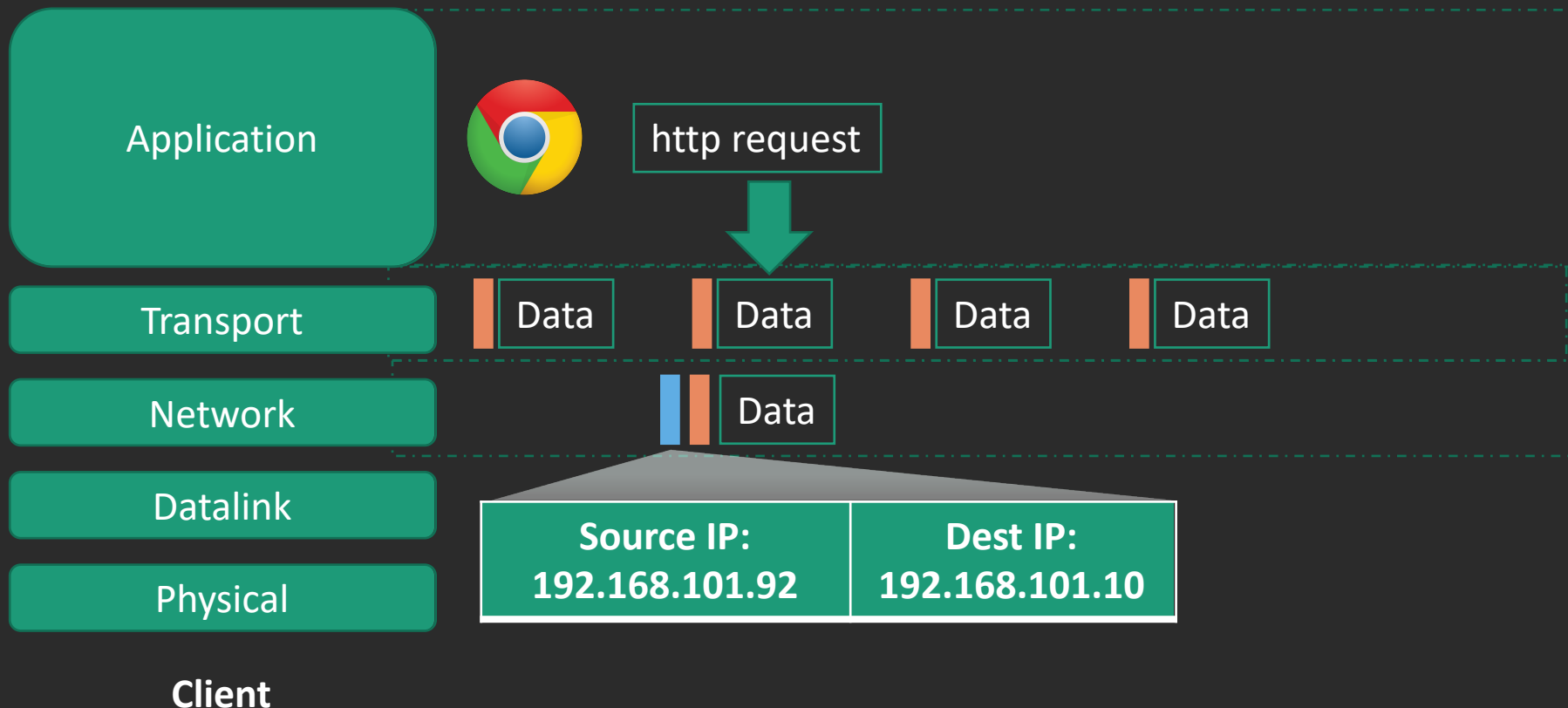
# *Understanding the communication between applications based on TCP/IP Model*



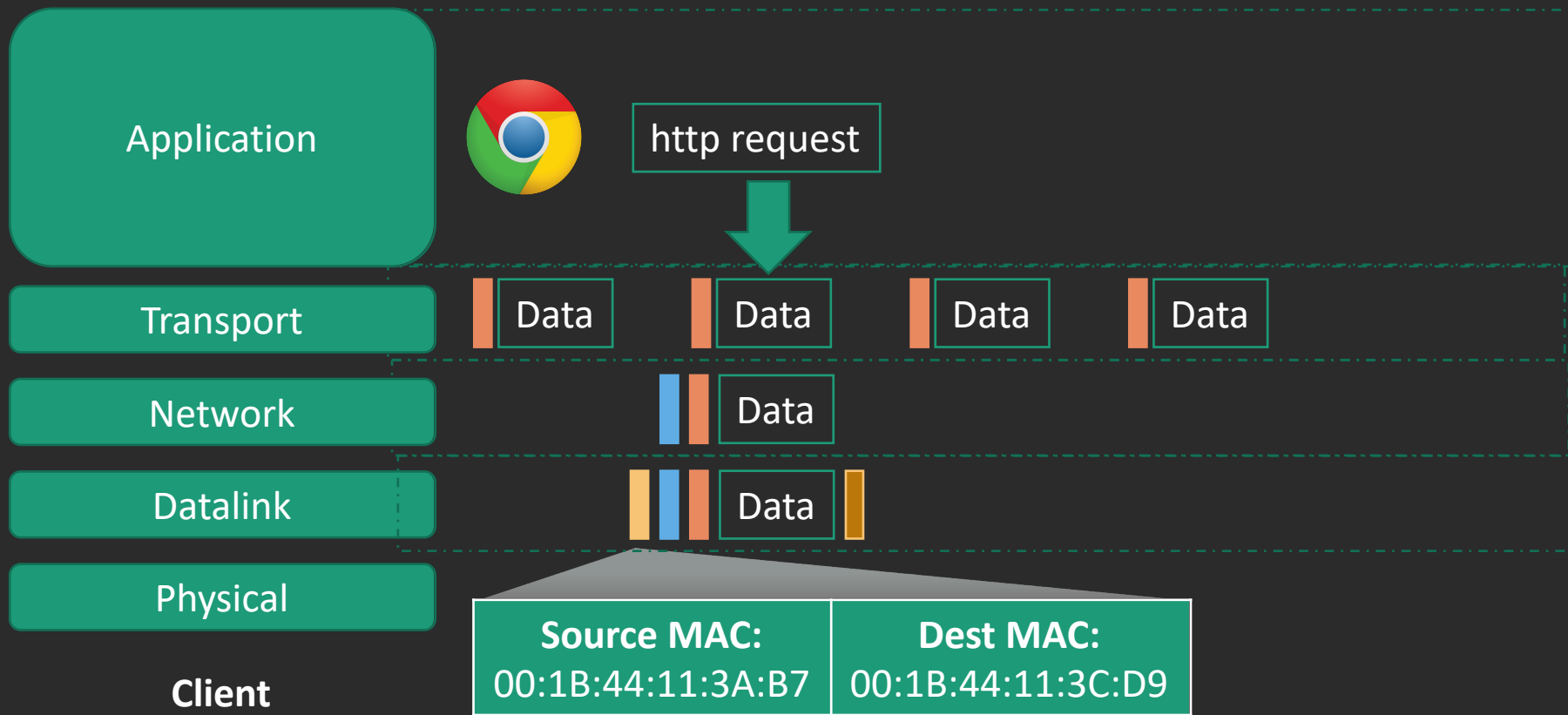
# *Understanding the communication between applications based on TCP/IP Model*



# *Understanding the communication between applications based on TCP/IP Model*

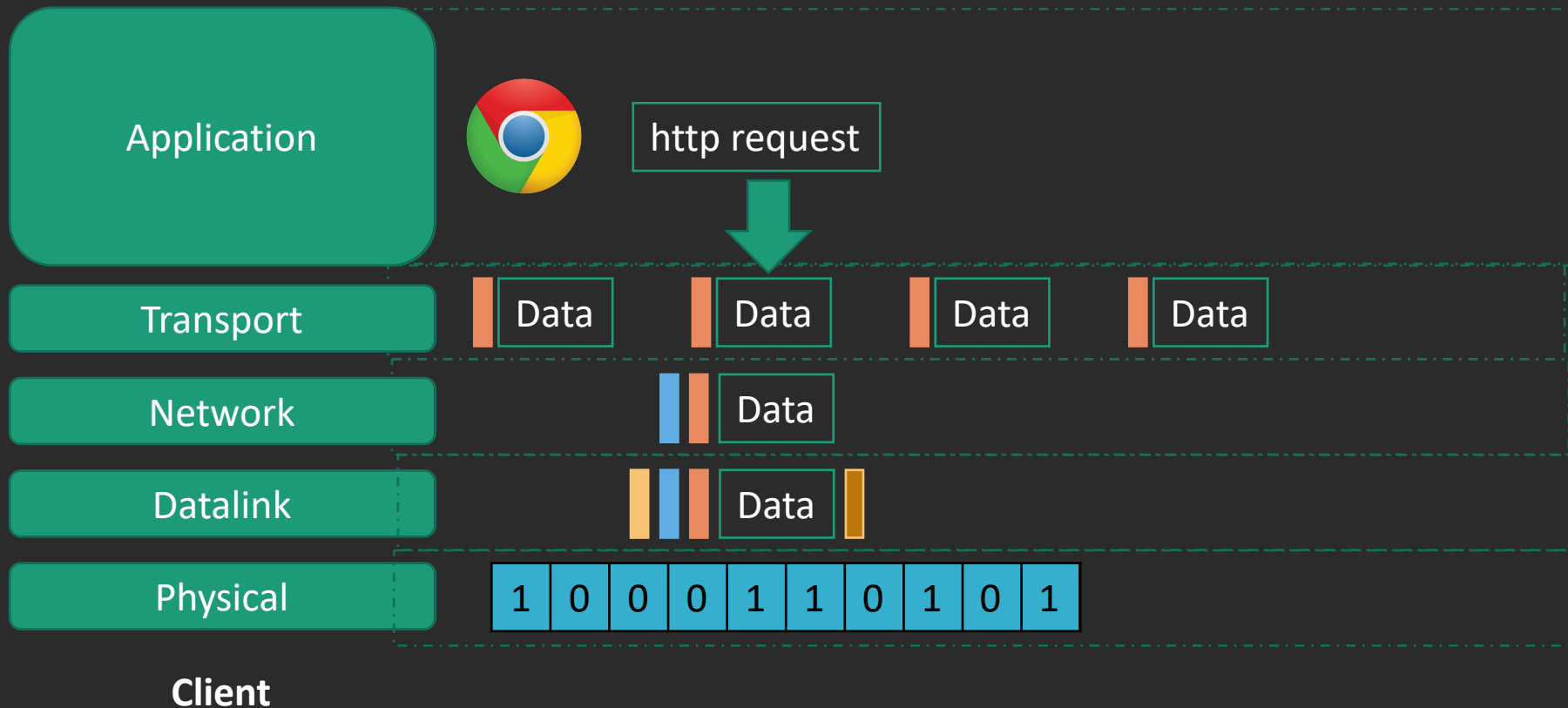


# *Understanding the communication between applications based on TCP/IP Model*

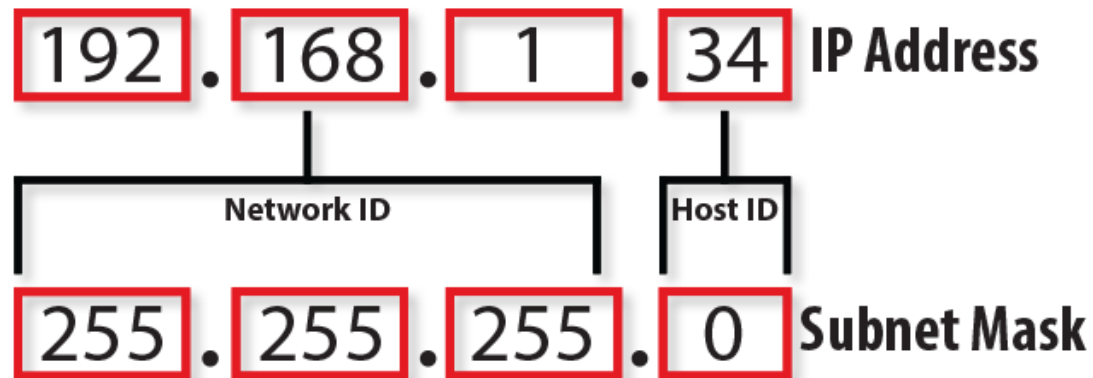




# Understanding the communication between applications based on TCP/IP Model



# ***IP Address and Netmask***



# Comparison of IPv4 and IPv6 Address

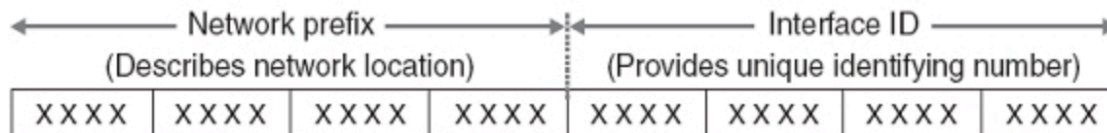
## 32-bit IPv4 address



YYY = 8 bits

(Resulting in 4,294,967,296 unique IP addresses)

## 128-bit IPv6 address



X X X X = 16 bits

(Resulting in 340,282,366,920,938,463,463,374,607,431,768,211,456 unique IP addresses)

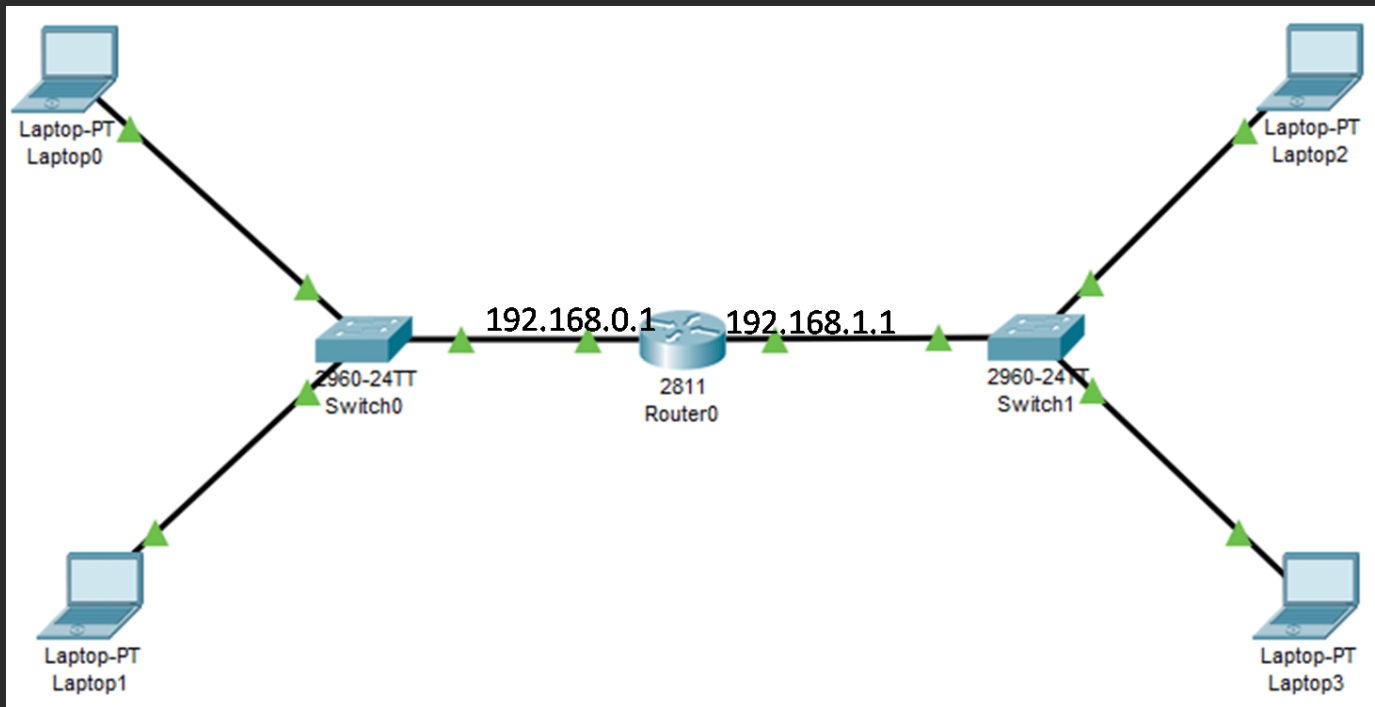
## Simplify IPv6 address

fed1:0000:0000:08d3:1319:8a2e:0370:7334

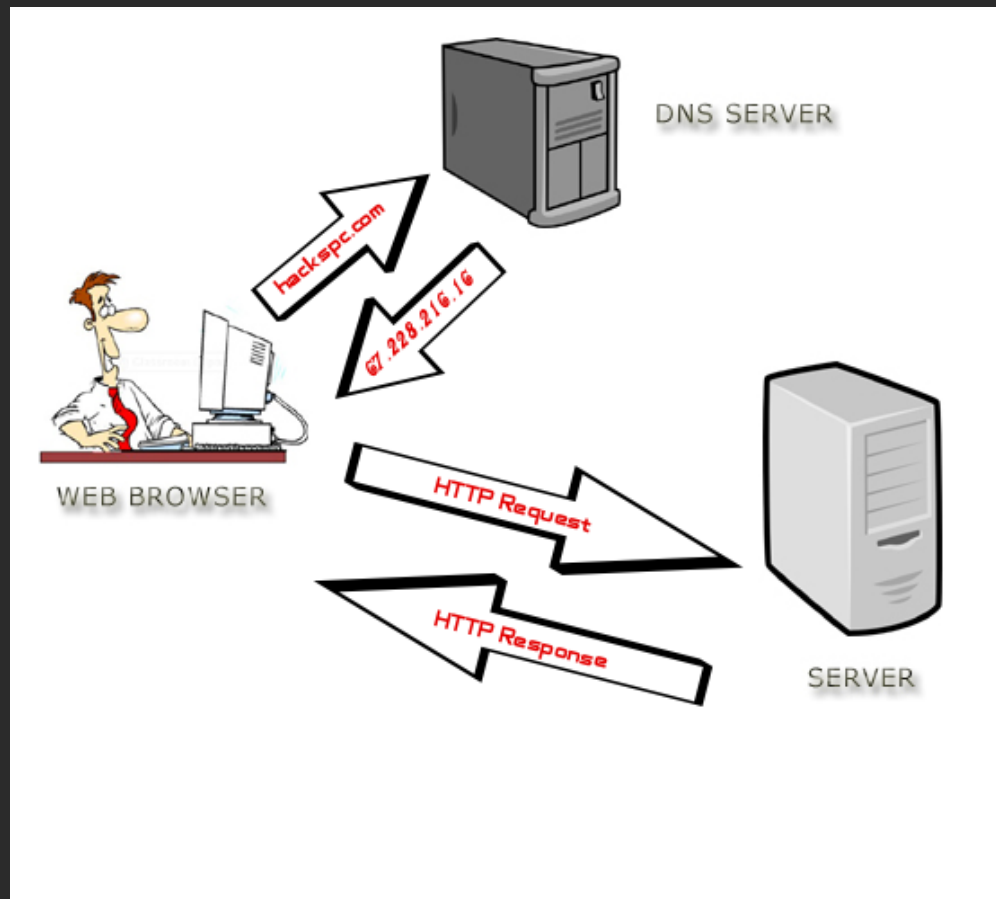


fed1::08d3:1319:8a2e:0370:7334

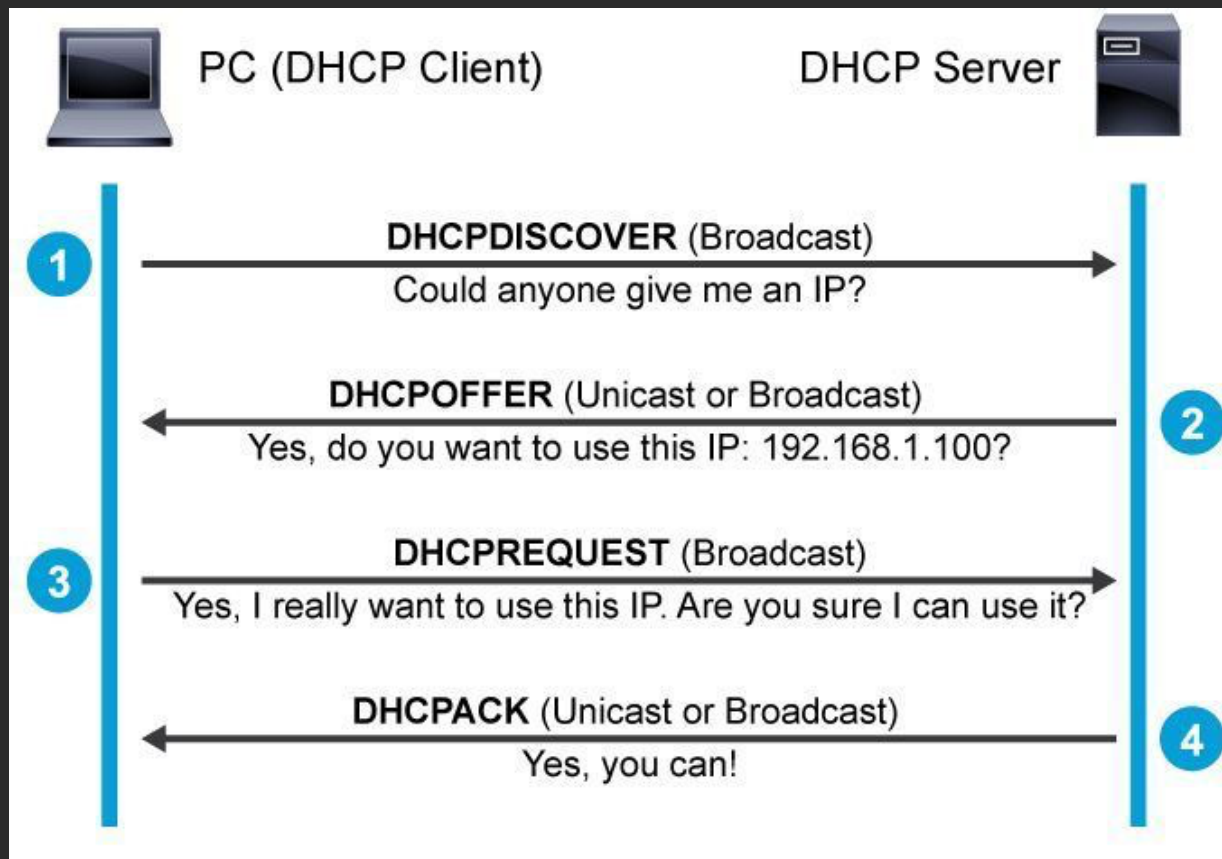
# Default router



# Domain Name System (DNS)



# Dynamic Host Configuration Protocol (DHCP)



# TCP/UDP well-known ports

Port	Protocol	Application
20	TCP	File Transfer Protocol (FTP) data
21	TCP	File Transfer Protocol (FTP) control messages
22	TCP	Secure Shell (SSH)
23	TCP	Telnet interactive protocol
25	TCP	Simple Mail Transfer Protocol (SMTP)
53	TCP&UDP	Domain Name System (DNS)
80	TCP	Hypertext Transfer Protocol (HTTP)
110	TCP	Post Office Protocol version 3 (POP3)
123	UDP	Network Time Protocol (NTP)
139	TCP	NetBIOS Session Service
143	TCP	Internet Message Access Protocol (IMAP)
161	UDP	Simple Network Management Protocol (SNMP)
162	UDP	Simple Network Management Protocol trap
389	TCP	Lightweight Directory Access Protocol (LDAP)
443	TCP	Hypertext Transfer Protocol (HTTPS) over TLS/SSL
465	TCP	Authenticated SMTP (SMTPS)
514	TCP&UDP	Remote Shell (TCP) or Syslog (UDP)
636	TCP	Lightweight Directory Access Protocol over TLS/SSL (LDAPS)
993	TCP	Internet Message Access Protocol over TLS/SSL (LDAPS)
995	TCP	Post Office Protocol 3 over TLS/SSL (POP3S)

*Question...* ■