OSI 7 Layer Model Flow Chart

User Computer
Assigned IP: 192.168.0.2
MAC: 4C-BB-2B-87-8C-D6

Google.com Web Server
Assigned IP: 10.54.251.94
MAC: 78-29-23-92-0B-BC

Layer 7 - Application
Format: Data
User Interface Program: Firefox
Human Interface to Webpage

Layer 6 - Presentation
Format: Data
Protocol: HTTPS GET
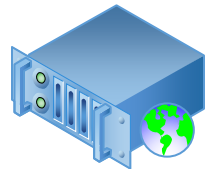Formats Data to be usable to user
Data Compression

Layer 5 - Session
Format: Data
Ephemeral Port: 50000
TLS Encryption
Maintains Connection between devices

Layer 4 - Transport
Format: Segments
Protocol: TCP
TLS Encryption
Transmit Data / Responsible for Reliability/Data Check Point

Layer 3 - Network
Format: Packets
Protocol: IP Address v4
Decides which physical path data will take

Layer 2 - Data Link
Format: Frames
Interface: NIC Card
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Cat5e Cable
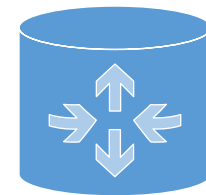Transmits raw bit stream over cable

User Network Switch Gateway
Assigned IP: 192.168.100.2
DHCP IP: 192.168.0.1/24
MAC: DA-71-8D-39-C3-2A

Layer 2 - Data Link
Format: Frames
Interface: NIC Card/Switch
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Cat5e Cable

Layer 1 - Physical
Format: Bits
Cat6a Cable

User Internet Router
Assigned IP: 68.2.200.10
DHCP IP: 192.168.100.1/24
MAC: 56-8A-45-93-51-4C

Layer 3 - Network
Format: Packets
Protocol: IP Address v4
Decides which physical path data will take

Layer 2 - Data Link
Format: Frames
Interface: NIC Card
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Cat6e Cable

Layer 1 - Physical
Format: Bits
Coaxial cable

Internet Backbone

Google Internet Router
Assigned IP: 172.217.11.174
DHCP IP: 172.16.0.1/16
MAC: 55-36-BE-EF-37-C6

Layer 3 - Network
Format: Packets
Protocol: IP Address v4
Decides which physical path data will take

Layer 2 - Data Link
Format: Frames
Interface: NIC Card
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Fiber Optic Cable

Layer 1 - Physical
Format: Bits
Cat7a Cable

Google Network Switch Gateway
Assigned IP: 172.16.10.5
DHCP IP: 10.0.0.1/8
MAC: 32-26-B0-DC-5C-7C

Layer 2 - Data Link
Format: Frames
Interface: NIC Card/Switch
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Cat7a Cable

Layer 1 - Physical
Format: Bits
Cat7a Cable

Layer 7 - Application
Format: Data
Interface Software: Apcahe
Sever Interface to Webpage

Layer 6 - Presentation
Format: Data
Protocol: HTTPS Listen
Formats Data to be usable to Server
Data Decompression

Layer 5 - Session
Format: Data
Logical Port: 443
TLS Encryption
Maintains Connection between devices

Layer 4 - Transport
Format: Segments
Protocol: TCP
TLS Encryption
Transmit Data / Responsible for Reliability/Data Check Point

Layer 3 - Network
Format: Packets
Protocol: IP Address v4
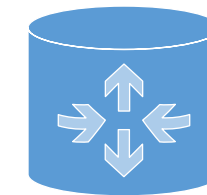Decides which physical path data will take

Layer 2 - Data Link
Format: Frames
Interface: NIC Card
MAC Address
Ethernet II framing
Defines Format/ Error Check

Layer 1 - Physical
Format: Bits
Cat7a Cable
Transmits raw bit stream over cable

Data – Layer 7 Application

Data – Layer 6 Presentation

Data

Data – Layer 5 Session

Data

TCP Segment – Layer 4 Transport

Source Port 16 bits 50000	Destination Port 16 bits 443

Sequence number 32 bits

Acknowledgment Number 32 bits

Header Length 4 bits	Empty 6 bits	Control Flags 6 bits	Window 16 bits

Checksum 16 bits	Urgent 16 bits

Options (0 – 16 bits) | Padding

Data
(0 – 65,515 bytes)

IPv4 Packet Datagram – Layer 3 Network

Version 4 4 bits	Header Length 4 bits	Service Type 8 bits	Total Length 16 bits

Identification 16 bits	Flags 4 bits	Fragment Offset 12 bits

TTL 8 bits	Protocol TCP 06 8 bits	Header Checksum 32 bits

Source IP Address
32 bits
68.2.214.13

Destination IP Address
32 bits
172.217.11.174

Options (if any)
0 – 40 Bytes | Padding

Segment
20 – 65,535 Bytes

Ethernet Frame Datagram – Layer 2 Data Link

7 Bytes | 6 Bytes | 6 Bytes | 2 Bytes | 46 - 1500 Bytes | 4 Bytes

Preamble	S F D	Destination Address 78 29 23 92 0B BC	Source Address 4C BB 2B 87 8C D6	Type 0800	Data	Frame Check Sequence

Binary Bits – Layer 1 Physical (Voltage/Light)

Bits

01010100 01101000 01101001 01110011 00100000 01101001 01110011 00100000 01000101 01110100 01101000 01100101 01110010 01101110 01100101 01110100 00100000 01000110 01110010 01100001 01101101 01100101 00100000 01100100 01100001
01110100 01100001 00100000 01101001 01101110 00100000 01100010 01101001 01110100 01110011