

4.0 DATA COMMUNICATION

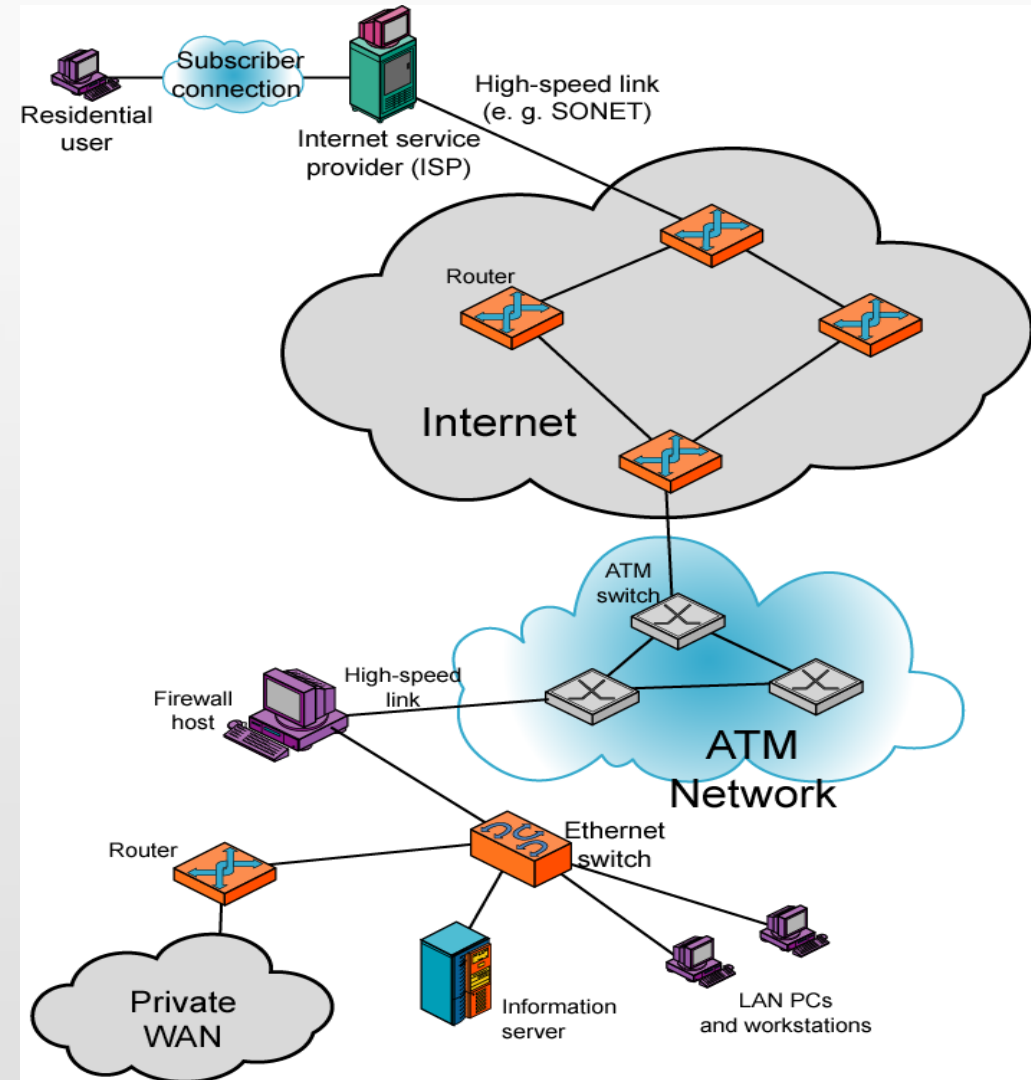
School of Education
Faculty of Social Sciences and Humanities

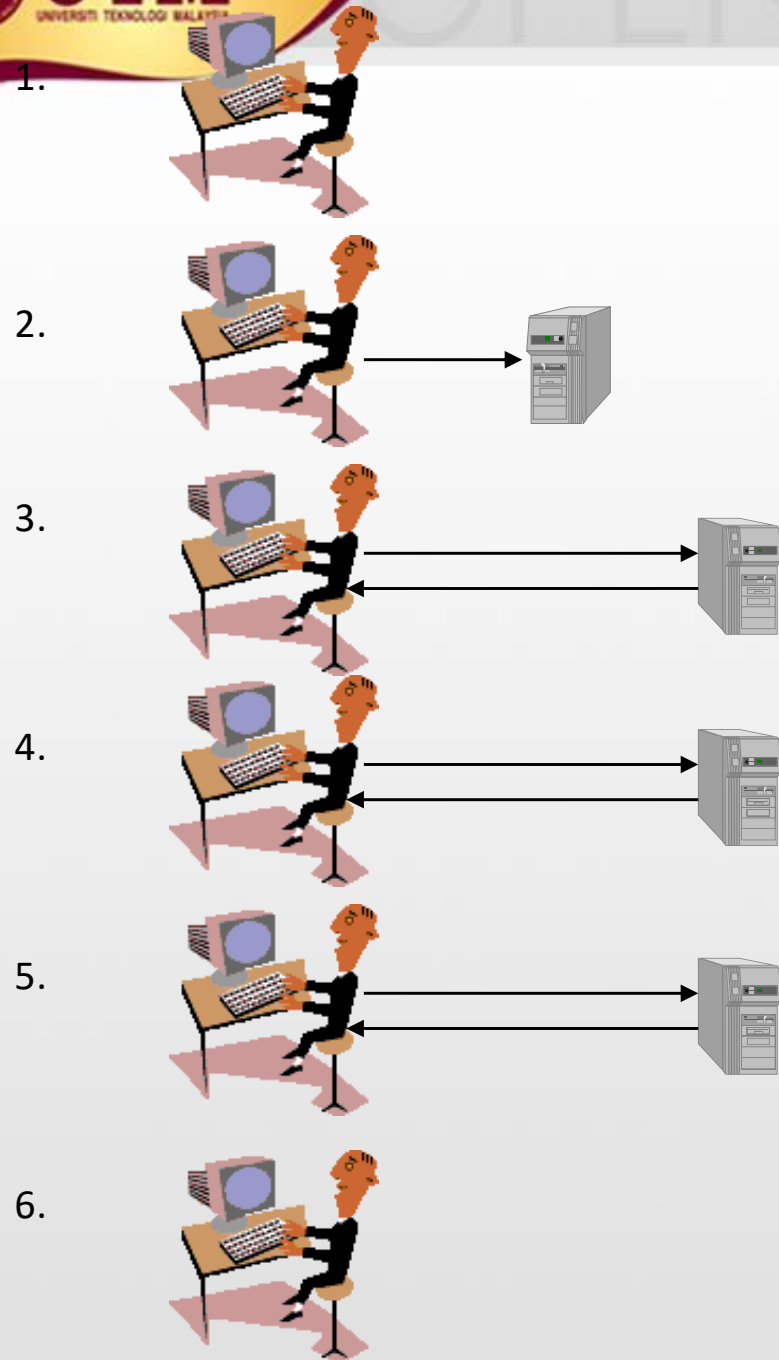
4.1

DATA COMMUNICATION

Data Communication

- **Data Communications** between two devices
- **Networks** provide networking services between two entities
- The communications between two end-points uses **Protocol**





1. The user clicks on a link to indicate which document is to be retrieved.

2. The browser must determine the address that contains the document. It does this by sending a query to its local name server.

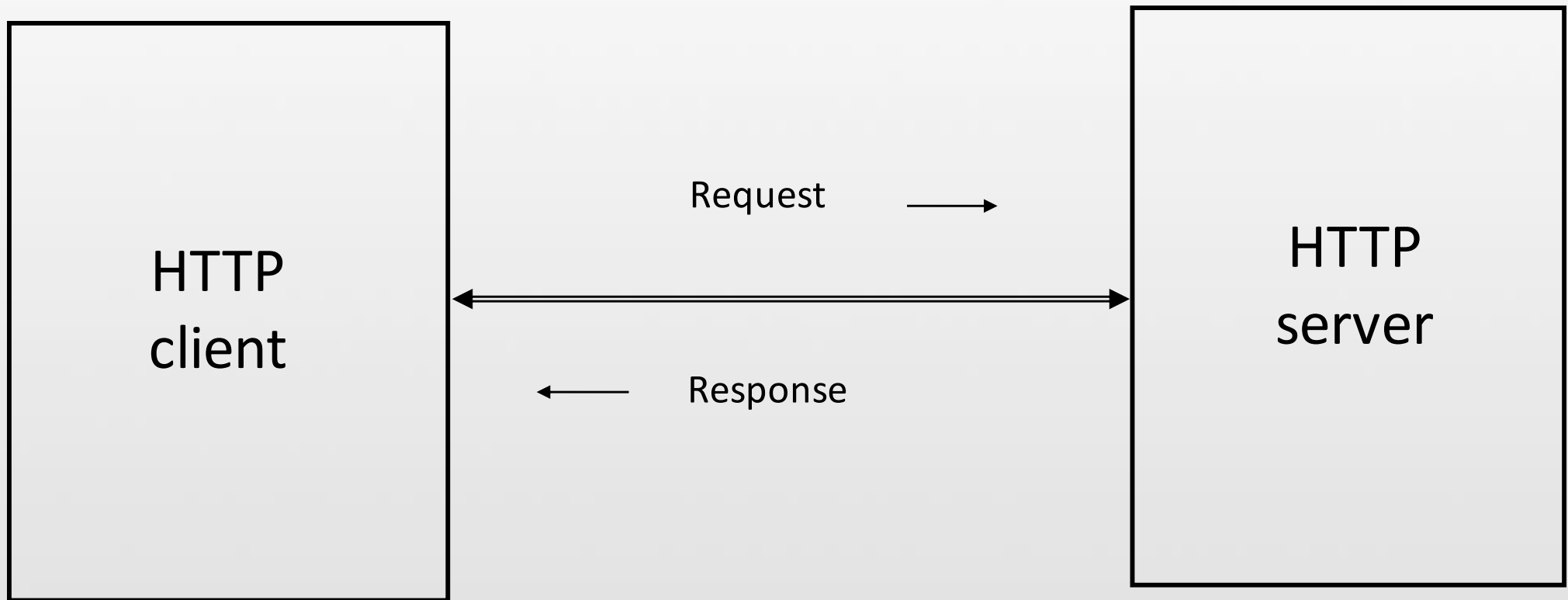
3. Once the address is known the browser establishes a connection to the specified machine, usually a **Transmission Control Protocol (TCP)** connection. In order for the connection to be successful, the specified machine must be ready to accept TCP connections.

4. The browser runs a client version of HTTP, which issues a request specifying both the name of the document and the possible document formats it can handle.

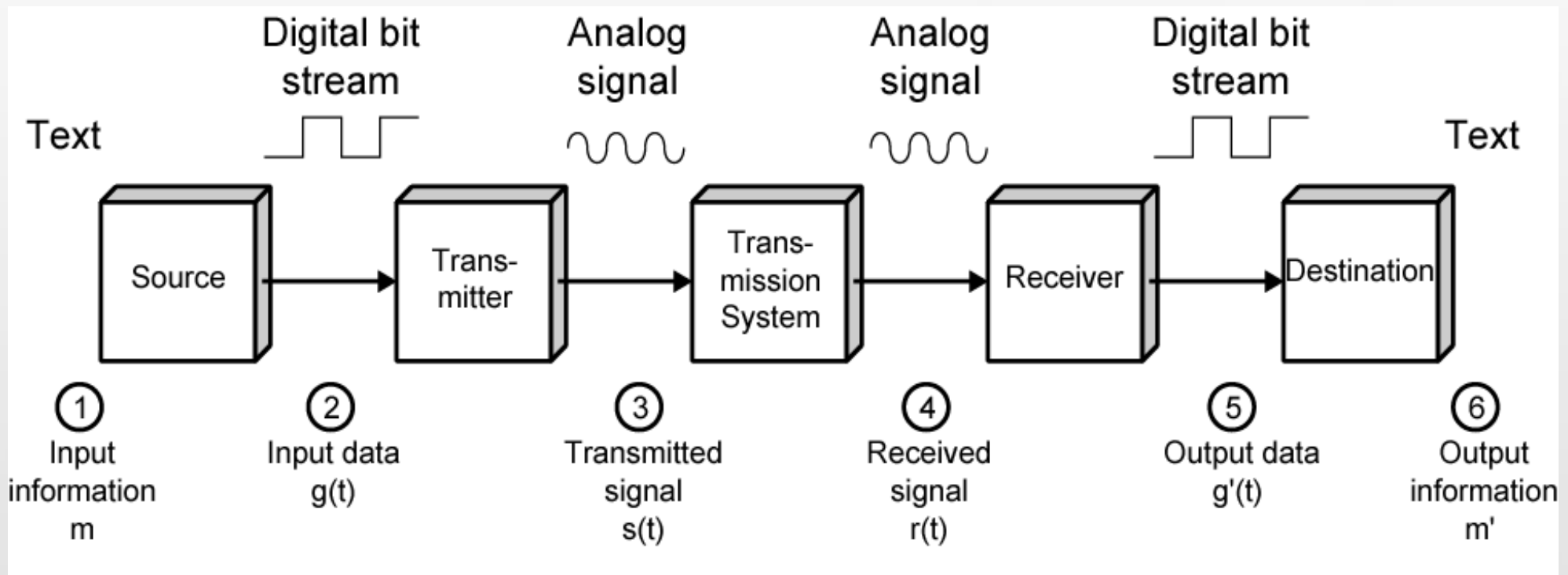
5. The machine that contains the requested document runs a server version of HTTP. It reacts to the HTTP request by sending an HTTP response which contains the desired document in the appropriate format.

6. The TCP connection is then closed and the user may view the document.

Data Communication



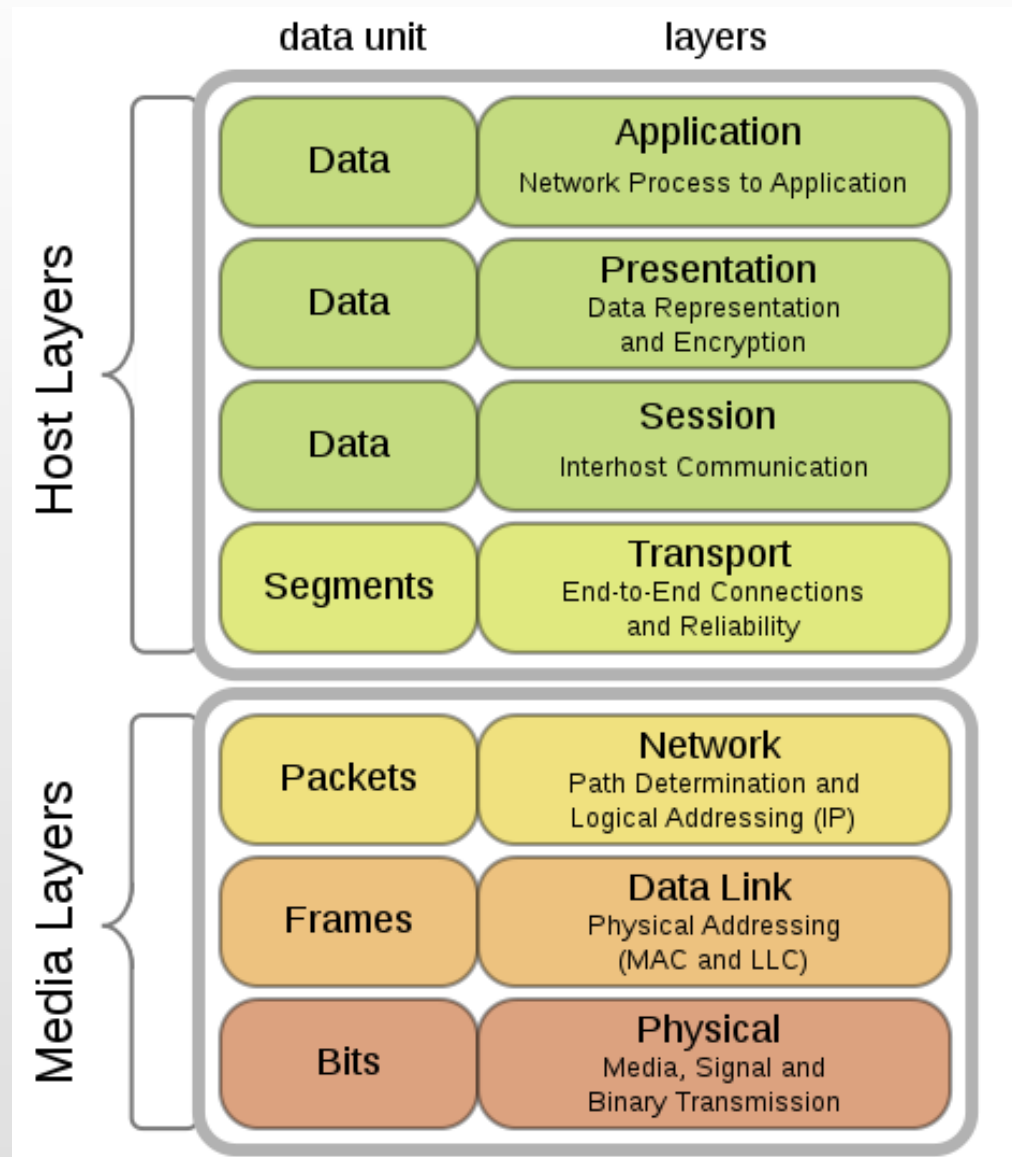
Data Communication



4.2

OPEN SYSTEM INTERCONNECT (OSI) MODEL

OSI Model



4.3

CHARACTER CODES

ASCII

- It is an acronym for the American Standard Code for Information Interchange.
- It is a standard seven-bit code that was first proposed by the American National Standards Institute or ANSI in 1963, and finalized in 1968 as ANSI Standard X3.4.
- The purpose of ASCII was to provide a standard to code various symbols (visible and invisible symbols)

ASCII

ASCII Chart			
A	01000001	P	01010000
B	01000010	Q	01010001
C	01000011	R	01010010
D	01000100	S	01010011
E	01000101	T	01010100
F	01000110	U	01010101
G	01000111	V	01010110
H	01001000	W	01010111
I	01001001	X	01011000
J	01001010	Y	01011001
K	01001011	Z	01011010
L	01001100		
M	01001101		
N	01001110		
O	01001111		

- Bytes can represent any collection of items using a “look-up table” approach
- ASCII is used to represent characters

ASCII

- In the **ASCII character set**, each binary value between 0 and 127 represents a specific character.
- Most computers extend the ASCII character set to use the full range of 256 characters available in a byte. The upper 128 characters handle special things like accented characters from common foreign languages.

ASCII

- Externally, it appears that human beings will use natural languages symbols to communicate with computer.
- But internally, computer will convert everything into binary data.
- Then process all information in binary world.
- Finally, computer will convert binary information to human understandable languages.

Unicode

- A worldwide character-encoding standard
- Its main objective is to enable a single, unique character set that is capable of supporting all characters from all scripts, as well as symbols, that are commonly utilized for computer processing throughout the globe
- Fun fact: Unicode is capable of encoding about at least 1,110,000 characters!

Unicode Text Encoding Examples

Character	Code Point	UTF-16	UTF-8
a	U+0061	0061	61
ä	U+00E4	00E4	C3 A0
σ	U+03C3	03C3	CF 83
κ	U+05D0	05D0	D7 90
۳	U+0663	0663	D9 A3
力	U+30AB	30AB	E3 82 AB
退	U+9000	9000	E9 80 80
尢	U+21BC1	D846 DFC1	F0 A1 AF 81