Learning Module

Subject Code	CS3	Client-side Web Development
Module Code	1.0	Introduction to Web Development
Lesson Code		
Time Frame	30 mins.	

◎ TARGET

Time Allocation: 1 minute
After completing this module, you are expected to:

- Briefly explain the structure of the World Wide Web
- Know the characteristics of HTML

HOOK

Time Allocation: 1 minute

Introduction to the Internet

Life now seems to be uneventful without the Internet. Everything in our daily life, from education to communication to entertainment is conducted with the help of being online. It makes accomplishing a lot of tasks easier, from searching for information to communicating with others, tasks which would otherwise be time-consuming.

This module will discuss the basic structure of the World Wide Web and how it will relate to our subject, Computer Science 3, which is Client-Side Web Development. After the discussion on the Internet structure is an introduction to HTML, the main language used by developers to present data over the Internet.

IGNITE

Time Allocation: 15 minutes

The Internet and the World Wide Web

Suppose you have an Internet connection at home. Figure 1 shows a typical home setup to enable you and your family to connect to the Internet. A home network is created by connecting the devices to a router which in turn is connected to the Internet. Data that comes from the Internet (download) and data that leaves the devices (upload) all go through the router. This resulting network is called a local area network.

The Internet is the network where computers and other devices are connected to each other. A local area network (LAN) and a wide area network (WAN) can be part of the Internet. Computers across continents can be part of the Internet.
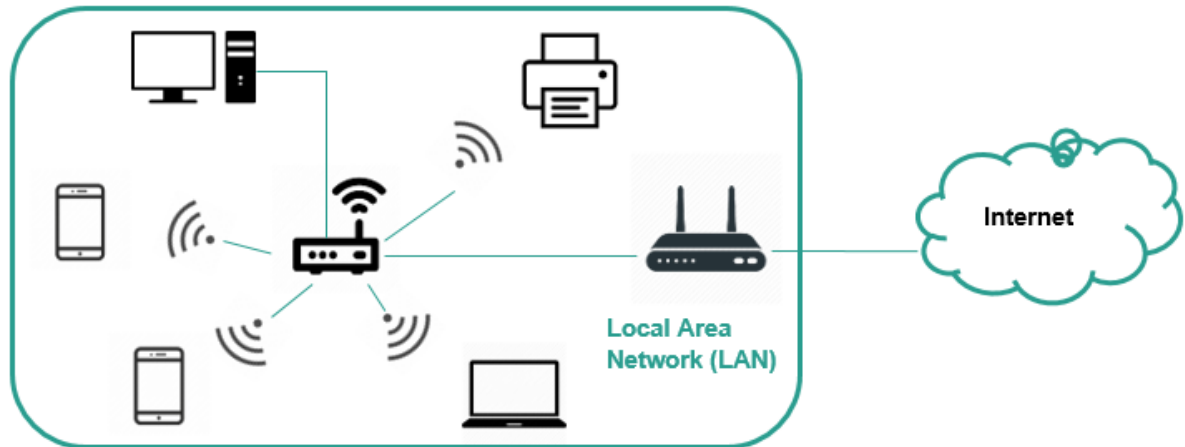
Figure 1. A sample home Internet connection. A set of devices connected in a single area is called a **local area network**.

Now imagine that all local area networks contain data and each individual LAN can access the data from the other LANs by means of sharing across the Internet. The resulting collection of data that is available over the Internet is called the World Wide Web.

The World Wide Web was invented by Tim Berners-Lee while working at CERN in 1989. The World Wide Web is the collection of information and services that travel over the Internet. If networks were a place, we can say that the World Wide Web is the people and the cars that move around and the Internet are the roads where everyone moves about.

Internet Services

There are various utilities that are available for users on the Internet. Some of the following are listed as follows:

1. Communication services

    - This includes electronic mail (e-mail), newsgroups and forums for discussion, instant messaging (chat), and video conferencing (examples are Zoom and Skype).

2. Information retrieval services

    - This service provides easier access to information present on the Internet. It consists of access to online databases of different files.

    - One example is the database of scientific journals where articles are published electronically.

3. Web services

    - This service covers the use of applications that make access to the Internet easier.

    - Examples are mobile apps and cloud computing services.

4. World Wide Web

    - Also known as W3, it is a structure that allows users to access web pages over the Internet. Webpages can contain text, images, and videos. They also contain

hyperlinks – clickable objects that allow the user to go from one page to another, thus allowing them to explore multiple web pages over the Internet.

The World Wide Web Structure

Access of information over the WWW works using the client-server model. Below is a basic representation of a client-server model.
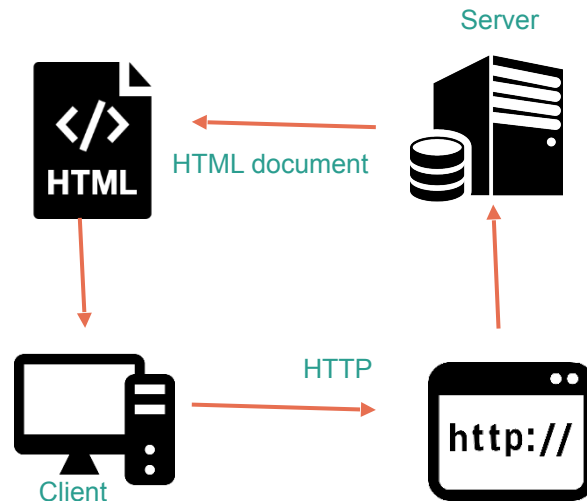
Figure 2. A basic client-server model

- The **client** is the computer (often browser) of the person trying to access the Internet. When a user tries to access the WWW, the client requests data from the server via a protocol (HTTP)

- **Hypertext Transfer Protocol (HTTP)** is a protocol that makes use of a request-response system. An HTTP request (sent by the client) consists of different types of information such as the uniform resource locator (URL) of the requested data. An HTTP response is sent by the server to communicate to the client. It consists also of different types of information such as the status of the connection and the data requested by the client.

- The **server** is a software/cloud computer that processes the client request and returns the requested data. If the requested data is not available, it requests the needed data from other servers where it temporarily becomes a client itself.

- When a request is successful, the requested data is sent as a **Hypertext Markup Language (HTML)** document. An HTML document can contain a wide range of data, from text to images to videos and is displayed by the client's browser.

Uniform Resource Locator (URL)

With so much information and resources over the Internet, a mechanism is needed to locate and access these resources. URLs serve as the address of these resources. The concept of URLs are similar to the concept of addresses in real life. A URL structure consists of:

- Protocol name

- Hostname (domain name) or IP address

- Path of the file

The syntax of a URL is:

```
protocol://hostname/filename
```

Examples:

```
https://www.w3schools.com/html/default.asp
https://www.facebook.com/profile
```

Web Development

Web development is the creation of web pages and other services to be accessed online. Other services include email, cloud services, and video streaming. Data over the Internet cannot be accessed without a user interface, thus enter web developers.

Web development consists of three parts:

- Client-side Web Development – involves the creation of front-end applications. Deal mainly with user interface and applications that interact with the user

- Server-side Web Development – involves the heavy programming of applications that the user does not see. Example is maintenance of cloud storage, email services, etc.

- Database Management – as the name implies, it deals with the maintenance of data online. It also includes creation of effective and fast ways of accessing data

Browsers

It is a software program that allows users to receive and send data from the Internet. Data over the Internet is presented via websites, consisting of multiple webpages. Data can be in the form of text, pictures, video, and audio. Browsers allow the user to view data in their intended format.

It also allows the user to navigate the Internet, allowing them to go from one website to another.

Browsers do all the communicating over the internet. If for example, you want to view a music video on Youtube, your browser sends requests to Youtube servers asking to have access to the video. The Youtube server then sends the requested data to your browser where you can then happily view the requested music video.

Hypertext Markup Language

HTML in short. It was developed to serve as the standard language for creating web pages. Websites before were created using different languages. Without a standard, it is difficult for users with different computers and different browsers to access information. Developers decided to create a standard language so that data over the Internet can be accessed in a uniform way.

The features of HTML that make it widely used in web development is that it is easy to learn and use. It is also platform independent, which means that it can be rendered in any type of device. It does not matter if it is a mainframe computer or a simple mobile phone for HTML to be read. Audio-visual materials can also be embedded into web pages because of HTML.

The most important feature of HTML that gave way to the World Wide Web is its ability to support hyperlinks. Hyperlinks allow different webpages to be connected to each other thus allowing the user to explore the World Wide Web.

One disadvantage of HTML though is that it can be used only for static web pages where the user can only click and scroll on items. When implementing interactive web pages, HTML must be

used in addition to other languages such as CSS and JavaScript. You will learn more about these other languages later in Computer Science 3.

NAVIGATE

Time Allocation: 10 minutes
Exercise (non-graded)

In your own words, describe the difference between the Internet and the WWW. Describe also how the client-server model structure of the WWW works. Although this is a non-graded exercise, you will still be required to submit your output to your teachers for comments and feedback.

KNOT

Time Allocation: 3 minutes
Summary

- The Internet is a network of devices connected either wirelessly or wired. They send and receive data from each other via this network.

- The World Wide Web is the collection of information that can be accessed via the Internet. It works on a client-server model structure where the client requests for information and the server sends the information as a response.

- Web development is the creation of resources to be made available over the Internet.

- Browsers allow users to receive and send data and navigate the Internet.

- HTML is the standard language used to create webpages.

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Images used
- https://image.flaticon.com/icons/png/512/30/30454.png
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- https://freeiconshop.com/wp-content/uploads/edd/html-solid.png
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