ASSIGNMENT 1 FRONT SHEET

Qualification	**BTEC Level 5 HND Diploma in Computing**		
Unit number and title	10: Website Design & Development		
Submission date		**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	
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Student declaration I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.			
		Student's signature	

Grading grid

P1	P2	P3	P4	M1	M2	M3	D1

☼ Summative Feedback:	☼ Resubmission Feedback:	
Grade:	**Assessor Signature:**	**Date:**
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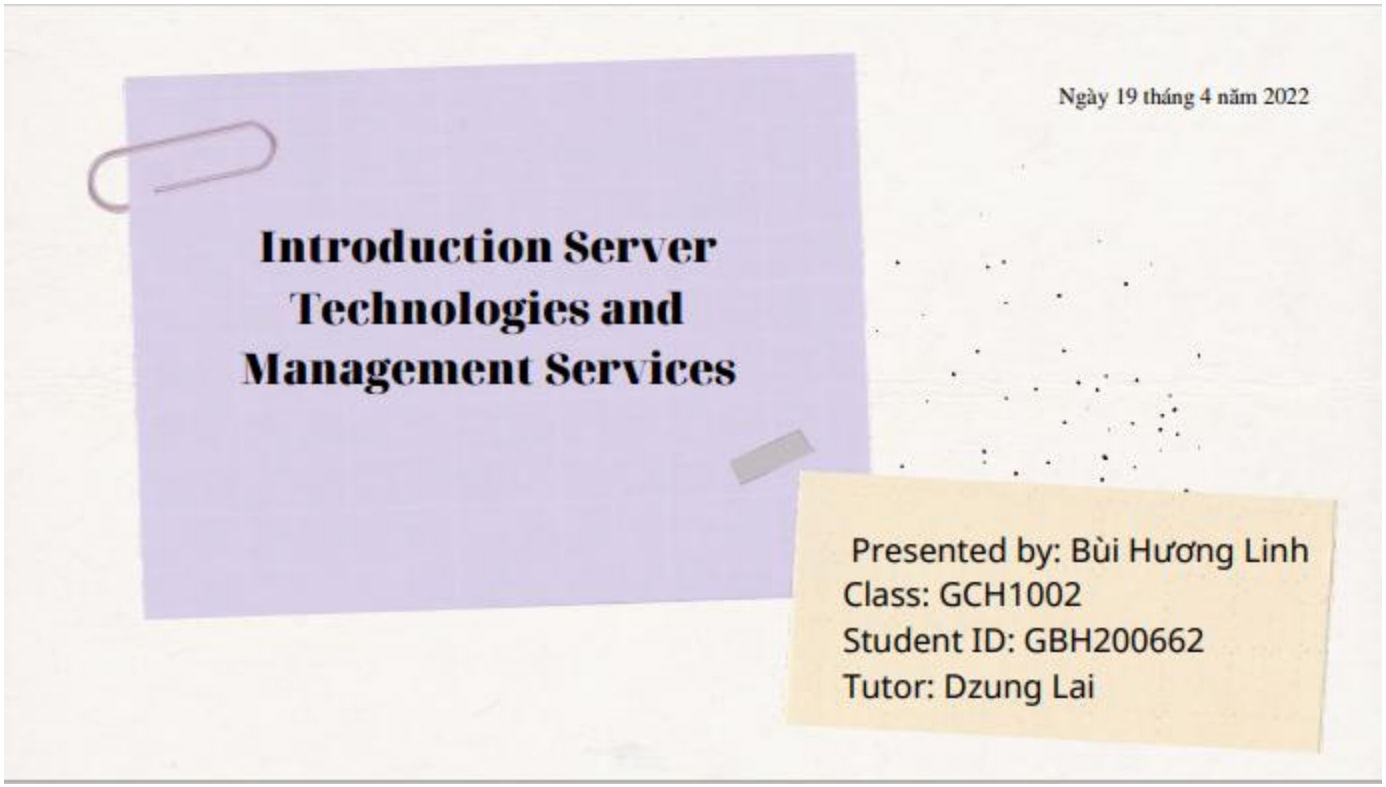
Task 1: PowerPoint Structure



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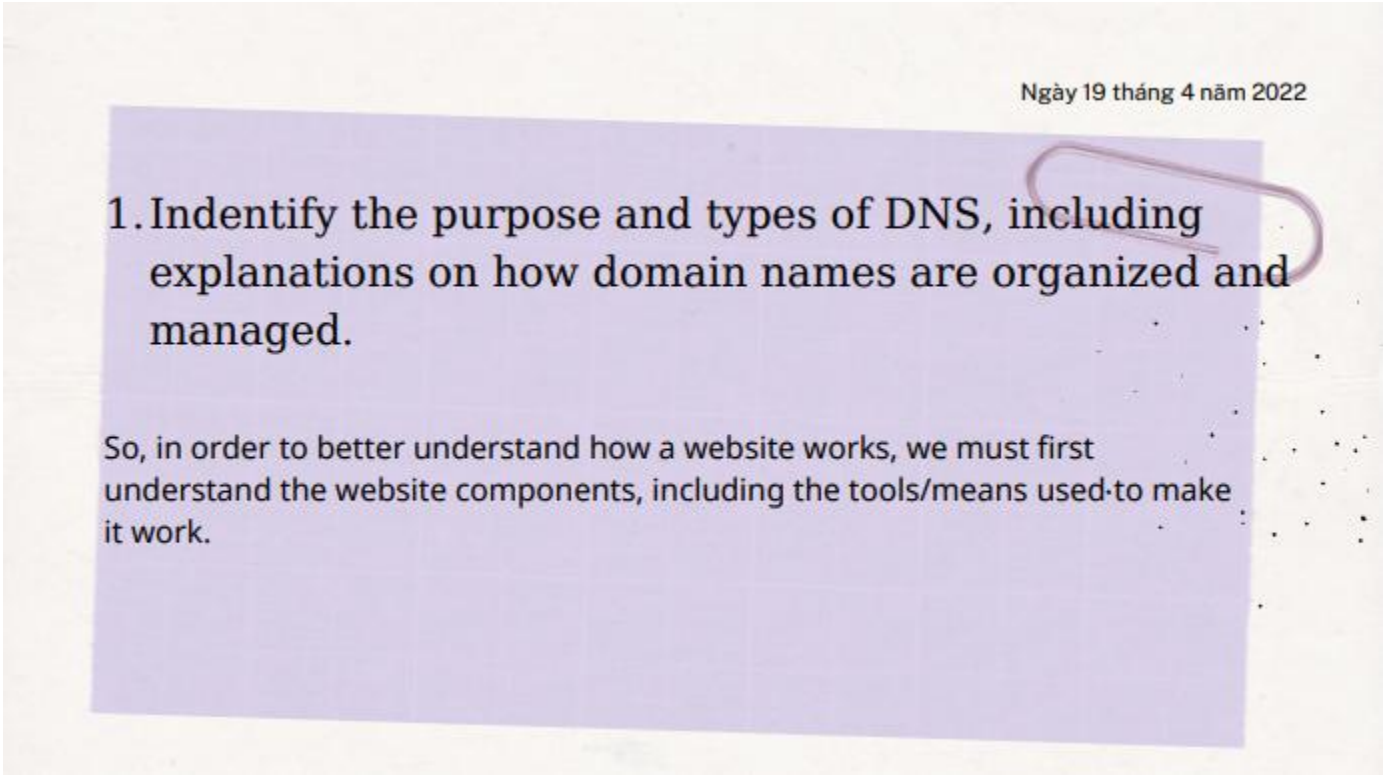

Ngày 19 tháng 4 năm 2022
1. Indentify the purpose and types of DNS, including explanations on how domain names are organized and managed.
So, in order to better understand how a website works, we must first understand the website components, including the tools/means used to make it work.

Introduction to WWW & History of the World Wide Web

What is Word Wide Web?

- The World Wide Web, also known as a Web, is a collection of websites or web pages stored in web servers and linked to local computers via the internet. Web pages formatted in HTML and linked by links called "hypertext" or hyperlinks and accessed via HTTP are the building blocks of the Web. These are electronic connections that connect related pieces of information so that users can quickly access the desired information.

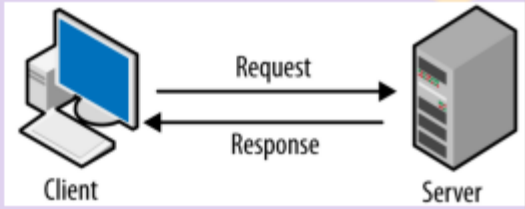
History of Web

- Tim Berners-Lee, a British scientist, created the World Wide Web (WWW) while working at CERN in 1989. The Web was created to meet the demand for automated information sharing among scientists in universities and institutes around the world.
- • CERN is not a solitary laboratory, but rather the hub of a vast community that includes over 17 000 scientists from over 100 countries. Despite spending some time at CERN, the scientists typically work at universities and national laboratories in their home countries. As a result, dependable communication tools are required.

How the Web works

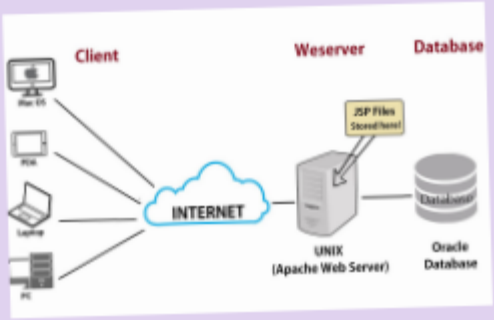
Clients and server

- Clients are the internet-connected devices of the average web user (for example, your computer connected to your Wi-Fi or your phone connected to your mobile network) and the web-accessing software available on those devices (usually a web browser like Chrome...).



Web server

- A place to store source code and website content.
- The web server is identified by its IP address.
- Web servers (private) are usually for large websites, small and medium.
- Websites often use a small portion of the web server's resources.



Domain name system (DNS)

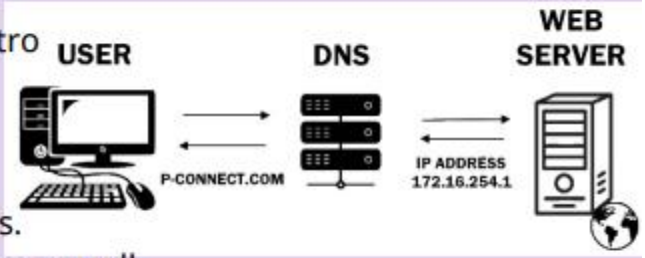
The Domain Name System (DNS) is a collection of databases that convert hostnames to IP addresses. DNS is known as the internet's phone book because it converts easy-to-remember hostnames such as www.google.com to IP addresses such as 216.58.217.46. This happens behind the scenes after you type a URL into the address bar of a web browser. Navigating the internet would be difficult without DNS (especially search engines like Google), because we'd have to enter the IP address of each website we wanted to visit.

Purpose of DNS

- DNS's primary function is to provide mapping between symbolic names and IP addresses in a global hierarchical and hierarchical database.
- Converts human readable domain name intro Internet
- Protocol (IP) addresses and vice versa.

Protocol (IP) addresses and vice versa

- A list of names that correspond to numbers.
- Assists in determining the website's address as well as the device in order for devices to communicate with one another more effectively easily.



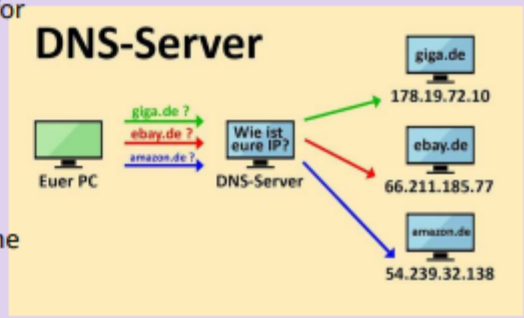
Types of DNS

- DNS Resolver

A DNS resolver (recursive resolver), is designed to receive DNS queries, which include a human-readable hostname such as "www.example.com", and is responsible for tracking the IP address for that hostname.

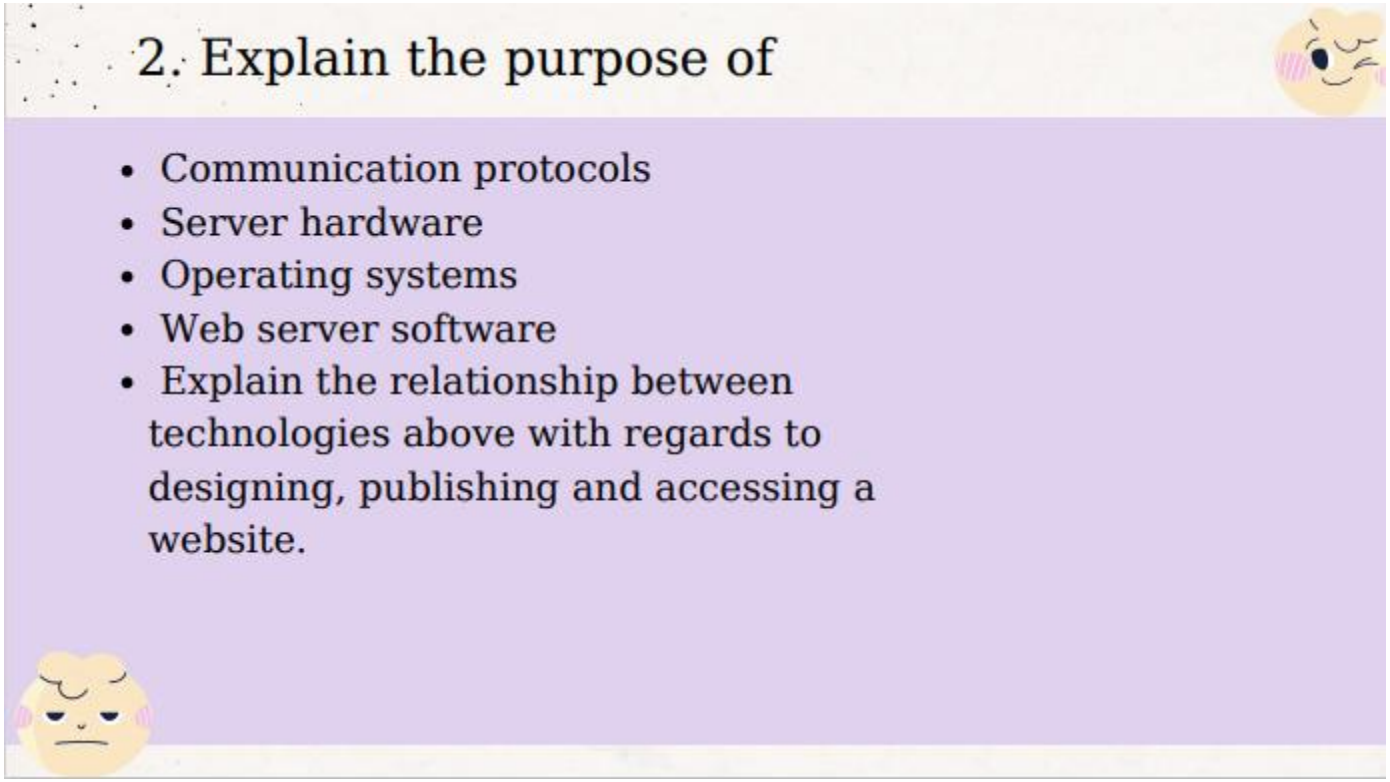
- DNS Root Server

The root server is the first step in the process of going from a hostname to an IP address. The DNS Root Server determines the Top Level Domain (TLD) from the user's query — for example, www.example.com — and provides information for the.com TLD Name Server. In turn, that server will provide information for domains in the.com DNS zone, such as "example.com."



- Authoritative DNS Server

Higher level DNS servers determine which DNS server is the "authoritative" name server for a specific hostname, which means it has the most up-to-date information for that hostname.

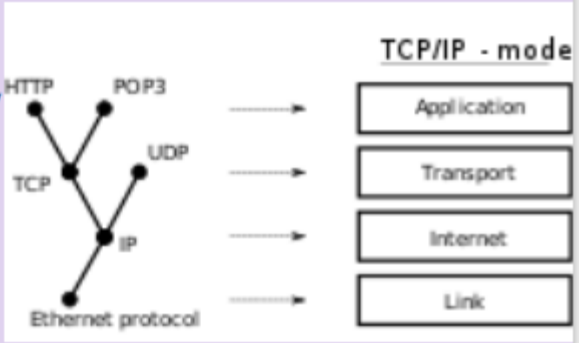

2. Explain the purpose of
Communication protocols
Server hardware
Operating systems
Web server software
Explain the relationship between technologies above with regards to designing, publishing and accessing a website.

Communication protocols

What does Communication protocols?

Protocols for communication are formal descriptions of digital message formats and rules. They must exchange messages within or between computing systems. Communication protocols are important in telecommunications and other systems because they ensure consistency and universality in message sending and receiving.

Protocols for communication can cover authentication, error detection and correction, and signaling. They are also capable of describing the syntax, semantics, and synchronization of analog and digital communications.



Communication protocols

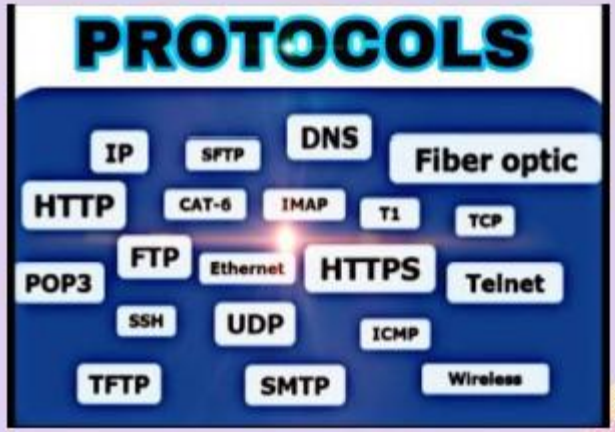
Types of protocols

Before successful transmission can occur, networked communications devices must agree on many physical aspects of the data to be exchanged. "Protocols" are rules that define data transmissions.

A protocol can define a wide range of transmission properties. Protocols may address the following properties, for example:

- Packet size.
- Transmission speed.
- Error correction types.
- Handshaking and synchronization techniques.
- Address mapping.
- Acknowledgment processes.
- Flow control.
- Packet sequence controls.
- Routing.
- Address formatting.

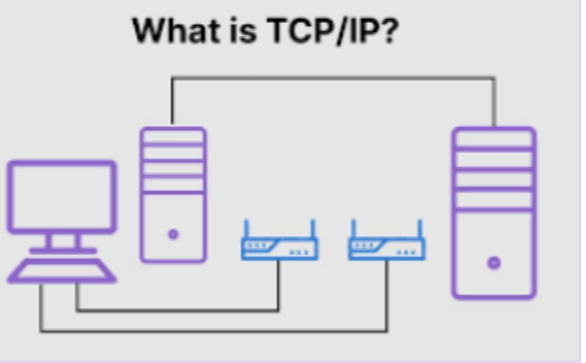
Popular protocols include File : Transfer Protocol (FTP), TCP/IP, User Datagram Protoco



Communication protocols

Transmission Control Protocols (TCP)

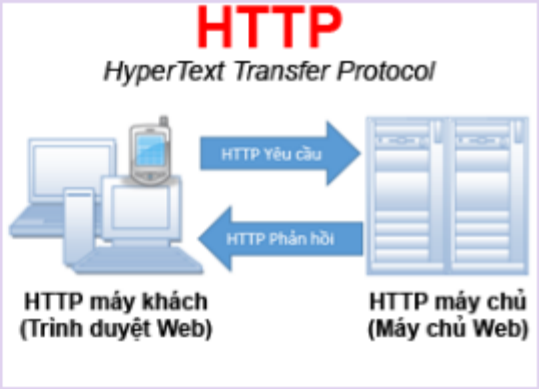
- TCP is an abbreviation for Transmission Control Protocol, a communications protocol that allows application programs and computing devices to exchange messages across a network. Its purpose is to send packets across the internet and ensure the successful delivery of data and messages across networks.
- TCP is a popular communication protocol that is used for network communication. It divides any message into a series of packets that are sent from source to destination, where they are reassembled.



Communication protocols

Hypertext Transfer protocols

(HTTP) is an application-layer protocol that is used to transmit hypermedia documents such as HTML. It was created to facilitate communication between web browsers and web servers, but it can also be used for other purposes. HTTP follows a classical client-server model, with a client opening a connection to make a request, then waiting until it receives a response. HTTP is a stateless protocol, which means that the server does not store any data (state) between requests.



Server hardware

Server Hardware is defined as computer hardware that operates in a local area network and runs administrative software that controls access to all or part of the network and its resources and makes such resources available to computers acting as network workstations.

- A computer with a large data memory
- Organize, retrieve, and transmit computer files and data.
- Complete tasks to keep the workflow running smoothly and productivity high.

Operating systems

An operating system is simply a type of software that serves as a bridge between computer hardware and the end user. A computer requires an operating system in order to function.

- An operating system's functions

An operating system provides various types of services to an application.

- Benefits of an Operating System

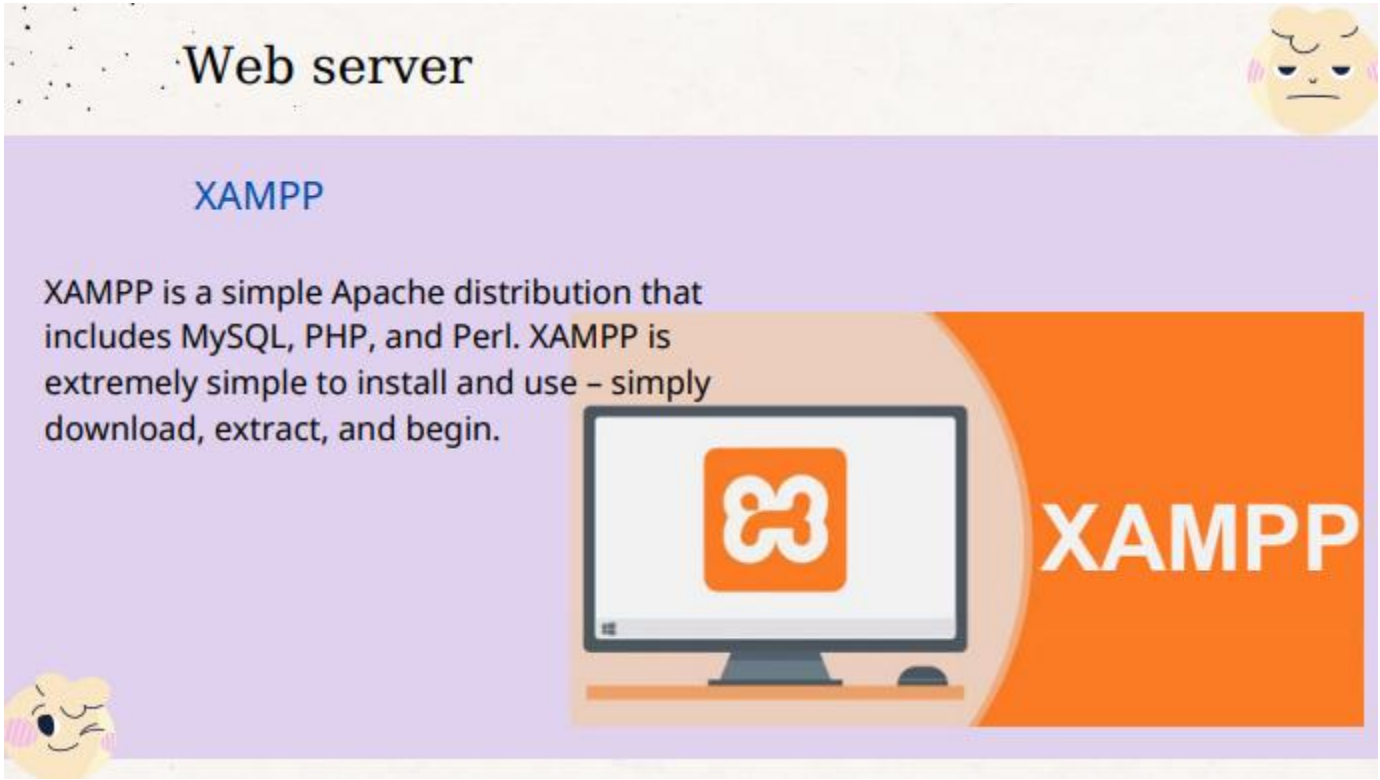
There are numerous benefits to using an operating system. The operating system also provides easy-to-use resources to the user, acting as an intermediary between the hardware and software systems.

Web Server Sofware

Server software is software that is intended to be used, operated, and managed on a computer server.

Alternatively, a server computer may be used to make files and programs available to other computers.

- Prevent SQL injections, XSS, and CSRF attacks.
- With proper documentation and examples, the configuration is simple to learn.
- A lightweight server that is ideal for older hardware and embedded systems • The best Unix web server with secure and advanced features.


Web server
XAMPP
XAMPP is a simple Apache distribution that includes MySQL, PHP, and Perl. XAMPP is extremely simple to install and use – simply download, extract, and begin.
XAMPP

3. Discuss the capabilities and relationships between front-end and back-end website technologies.

Dynamic Web Server

It is also a static web server that has been enhanced with the help of an application server or databases. When a client sends a request, the application server modifies or updates the hosted file before delivering it to the client via HTTP server.

Advantages

- Much more functionality
- Easy to update
- Always a fresh site the brings in new visitors or/and prospective customers
- A system that provides for unique collaboration of the admin., staff and the visitors/users

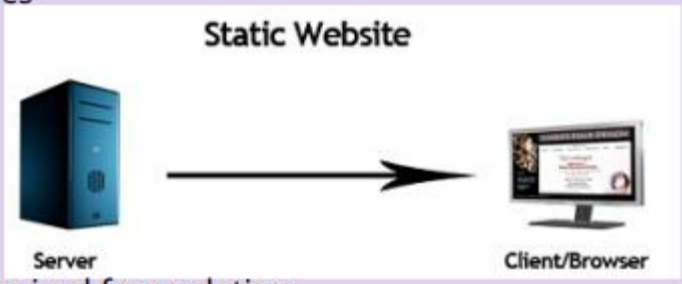
Disadvantages

- More expensive
- Require time for development
- Higher hosting costs

3. Discuss the capabilities and relationships between front-end and back-end website technologies.

Static Web Server

It is built on the foundation of a physical server (hardware) and an HTTP server (software). When a client uses his browser to request a specific file, the static web server sends the hosted files in their entirety.



Advantages

- Are relatively easy to develop
- Are less expensive to develop
- Are also relatively inexpensive to host.

Disadvantages

- A good web-development expertise is required for updating static web-pages
- The site may not be very useful for visitors and users
- The site may suffer from content stagnation.

3. Discuss the capabilities and relationships between front-end and back-end website technologies.

Front-end

Front-end development is an important aspect of web development that you should be familiar with. Front-end A developer is someone who creates interfaces based on design patterns.

- Proficient in programming languages such as HTML, CSS, and Javascript.
- Web design that is mobile-friendly.
- SEM (Search Engine Marketing) (SEO).
- AJAX and asynchronous request handling
- Issues with cross-browser compatibility and workarounds
- Testing from start to finish with a headless browser.
- A one-page application.

3. Discuss the capabilities and relationships between front-end and back-end website technologies.

Back-end

In contrast to Front-end, the work of a Back-end Developer is usually not visible to the outside world because they frequently manipulate the server and data.

- Programming languages such as Node.js, PHP, Python, Ruby, or Perl.
- Language-specific Automated Testing Frameworks
- Information transformation.
- Access to Application Data
- Concerns about security, authentication, and authorization.

Relationships between front-end & back-end website technologies

Front-End and Back-End refer to the separation of concerns between the presentation layer, application layer, and database layer, as well as the application layer in front-end and two layers in back-end, namely application and database layer.

Three different layers of front-end and back end include:

- Presentation Layer
- Application layer
- Database Layer


4. A review of different website technologies supported with the tools & sofware used to develop website
• Frond-end technologies
• Back-end technologies
• Databases
• IDEs
• CMS
• Website builders

Front-end technologies

To be known as a front-end developer, you must first master some fundamental skills. Some of these require you to be an expert. Then there are the desirable abilities.

Front-end languages:

- HTML
- CSS
- Java scrip
- J query
- ReactJS

Back-end technologies

Back-end technologies, such as languages, must be dealt with by programmers or back-end developers in order to handle the back end of given applications.

Back-end languages:

- Java
- PHP
- Python
- SQL
- ASP.NET

CMS technologies

When you hear the word CMS, you immediately think of content management systems, don't you? And now I'll introduce you to the three most popular content management systems:

- CMS WordPress
- CMS Joomla
- CMS Magento

Website Builders Technologies

Some website builders :

- Wix
- Squarespace
- Weebly
- Duda
- ....

Databases

Some Databases technologies use:

- Microsoft SQL Server
- PostgreSQL
- MySQL

IDEs technologies

Some IDE technologies use:

- Visual Studio Code
- IntelliJ IDEA
- Sublime Text
- Xcode
- WebStorm

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Ngày 19 tháng 4 năm 2022
Thanks for listening
Chúc bạn một ngày tốt lành.

Task 2: Guidebook/Report

I. Identify the purpose and types of DNS, including explanations on how domain names are orgainises and managed (P1)

1. History of Website

   Tim Berners-Lee, a computer scientist, invented the World Wide Web in 1989 in a laboratory in Geneva, Switzerland. (Javatpoint, 2021) He devised a method for navigating between files that makes use of:

   - Hyper link Framework (HTTP).
   - Hyper Text Markup Language (HTML).
   - Web browser and web server.

2. How does the Website work

   Clients are the internet-connected devices of the average web user (for example, your computer connected to your Wi-Fi or your phone connected to your mobile network) and the web-accessing software available on those devices (usually a web browser like Chrome...). (Developer, 2022)

3. Web server

   ✓ A place to store source code and website content.
   ✓ The web server is identified by its IP address.
   ✓ Web servers (private) are usually for large websites, small and medium.
   ✓ Websites often use a small portion of the web server's resources.

4. Domain name system(DNS)

   The Domain Name System (DNS) is a collection of databases that convert hostnames to IP addresses. DNS is known as the internet's phone book because it converts easy-to-remember hostnames such as www.google.com to IP addresses such as 216.58.217.46. This happens behind the scenes after you type a URL into the address bar of a web browser. Navigating the internet would be difficult without DNS (especially search engines like Google), because we'd have to enter the IP address of each website we wanted to visit. (Networkstraining, 2022)

5. The purpose of DNS

- DNS's primary function is to provide mapping between symbolic names and IP addresses in a global hierarchical and hierarchical database.

- Converts human readable domain name intro Internet
- Protocol (IP) addresses and vice versa.

- Protocol (IP) addresses and vice versa
  - A list of names that correspond to numbers.
  - Assists in determining the website's address as well as the device in order for devices to communicate with one another more effectively easily.
    (Ns1, 2022)

6. Types of DNS

   In total, about 3 types of servers participate in the domain name resolution system:

   - ✓ DNS Recursive resolvers: A DNS resolver (recursive resolver), is designed to receive DNS queries, which include a human-readable hostname such as “www.example.com”, and is responsible for tracking the IP address for that hostname.
   - ✓ DNS Root Server: The root server is the first step in the process of going from a hostname to an IP address. The DNS Root Server determines the Top Level Domain (TLD) from the user's query — for example, www.example.com — and provides information for the.com TLD Name Server. In turn, that server will provide information for domains in the.com DNS zone, such as "example.com."
   - ✓ Authoritative Name server: Higher level DNS servers determine which DNS server is the "authoritative" name server for a specific hostname, which means it has the most up-to-date information for that hostname.
     (Cloudflare, 2022)

II. Explain the purpose of (P2)

1. Communication protocols

   Communication protocols are formal descriptions of digital message formats and rules. They are required to exchange messages in or between computing systems. There are several protocols used to communicate or convey information on the Internet:

   - ✓ TCP/IP: Transmission Control Protocol and Internet Protocol are communication protocols that specify how data should be transmitted across the internet. TCP facilitates the connection of client devices to servers based on their IP addresses.

- ✓ DNS: Domain Name System converts website domain names into numeric IP addresses on the server.
- ✓ HTTP: Hyper Text Transfer Protocol is an application protocol that defines the language that client devices and servers use to communicate with one another.
  (Fortinet, 2022), (Developer, 2022)

2. Server hardware
   Server Hardware is defined as computer hardware that operates in a local area network and runs administrative software that controls access to all or part of the network and its resources and makes such resources available to computers acting as network workstations.
   - ✓ A computer with a large data memory
   - ✓ Organize, retrieve, and transmit computer files and data.
   - ✓ Complete tasks to keep the workflow running smoothly and productivity high.

   (Dealna, 2022)

3. Operating systems
   An operating system is simply a type of software that serves as a bridge between computer hardware and the end user. A computer requires an operating system in order to function.
   - ✓ An operating system's functions: An operating system provides various types of services to an application.
   - ✓ Benefits of an Operating System: There are numerous benefits to using an operating system. The operating system also provides easy-to-use resources to the user, acting as an intermediary between the hardware and software systems.
     (Max, 2020)

4. Web server software
   Server software is software that is intended to be used, operated, and managed on a computer server. Alternatively, a server computer may be used to make files and programs available to other computers.
   - ✓ Prevent SQL injections, XSS, and CSRF attacks.
   - ✓ With proper documentation and examples, the configuration is simple to learn.
   - ✓ A lightweight server that is ideal for older hardware and embedded systems • The best Unix web server with secure and advanced features.

(Bill, 2021)

III. Discuss the capabilities and relationships between front-end and back-end website technologies. (P3)

1. What is front-end

Front-end development is an important aspect of web development that you should be familiar with. Front-end A developer is someone who creates interfaces based on design patterns.

- ✓ Proficient in programming languages such as HTML, CSS, and Java script.
- ✓ Web design that is mobile-friendly.
- ✓ SEM (Search Engine Marketing) (SEO).
- ✓ AJAX and asynchronous request handling.
- ✓ Issues with cross-browser compatibility and workarounds.
- ✓ Testing from start to finish with a headless browser.
- ✓ A one-page application.

2. What is back-end

In contrast to Front-end, the work of a Back-end Developer is usually not visible to the outside world because they frequently manipulate the server and data.

- ✓ Programming languages such as Node.js, PHP, Python, Ruby, or Perl.
- ✓ Language-specific Automated Testing Frameworks
- ✓ Concerns about security, authentication, and authorization.
- ✓ Information transformation.
- ✓ Access to Application Data

3. Relationships between front-end & back-end website technologies

Front-End and Back-End refer to the separation of concerns between the presentation layer, application layer, and database layer, as well as the application layer in front-end and two layers in back-end, namely application and database layer.

Three different layers of front-end and back end include:

- ✓ Presentation Layer

- ✓ Application layer
- ✓ Database Layer

(Trego, 2016)

IV. A review of different website technologies supported with the tools and sofware used to develop websites (P4)

1. Frond-end technologies

   To be known as a front-end developer, you must first master some fundamental skills. Some of these require you to be an expert. Then there are the desirable abilities.

   Front-end languages:

   - HTML
   - CSS
   - Java scrip
   - J query
   - ReactJS

2. Back-end technologies

   Back-end technologies, such as languages, must be dealt with by programmers or back-end developers in order to handle the back end of given applications.

   Back-end languages:

   - Java
   - PHP
   - Python
   - SQL
   - ASP.NET

3. Databases

Database technologies store, organize, and process information in a way that allows users to easily and intuitively go back and find details they are looking for. Database technologies come in a variety of sizes and shapes, ranging from complex to simple, large to small.

- ✓ MySQL
- ✓ Microsoft SQL Server
- ✓ PostgreSQL

.....

4. IDEs technologies

Web development IDEs are powerful tools with numerous features such as autocomplete, syntax checking, debugger, providing a suggestion, viewing a live web page inside the IDE for a better understanding of the output, and so on. Some IDE technologies use:

- ✓ Visual Studio Code
- ✓ Sublime Text
- ✓ X code
- ✓ Web Storm

5. CMS technologies

When you hear the word CMS, you immediately think of content management systems, don't you? And now I'll introduce you to the three most popular content management systems:

- ✓ CMS WordPress
- ✓ CMS Joomla
- ✓ CMS Magento

.....

6. Website builders

A Website Builder is a software or a set of tools, developed by IT professionals with the aim to help people who do not know how to code, design or build their own websites.

- ✓ Wix
- ✓ Squarespace
- ✓ Weebly
- ✓ Duda

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(springwk_wp, 2015), (Trego, 2016)

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