Web Technologies 1

The Internet

Lec1

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The internet

- The Internet
  - The Internet is a massive network of networks. It connects millions of computers together globally, forming a network in which any computer can communicate with any other computer. Information that travels over the Internet does so via a variety of languages known as protocols.

- The World Wide Web(www)
  - The World Wide Web, or simply Web, is a way of accessing information over the medium of the Internet. It is an information-sharing model that is built on top of the Internet. The Web uses the HTTP protocol, only one of the languages spoken over the Internet, to transmit data. Web services, which use HTTP to allow applications to communicate in order to exchange business logic, use the Web to share information. The Web also utilizes browsers, such as Internet Explorer or Firefox, to access Web documents called Web pages that are linked to each other via hyperlinks. Web documents also contain graphics, sounds, text and video.

History

- There are many different LAN technologies: Ethernet, Token Ring, ATM, etc.
- Each has different ways to connect computers, format data packets, data transmission rates, etc and thus incompatible.
- Desirability of a single network to enable resource sharing.
- US starts funding research on how to interconnect the networks.
- 1969 ARPANET (Advance Research Project Agency Networks) was developed this was the first Internet.
- E-mail was adapted for ARPANET in 1972.
- 1972 First public demonstration of ARPANET.
- The telnet protocol, enabling logging on to a remote computer started in 1972.
- The ftp protocol, enabling file transfers between Internet sites, started in 1973.
- The first networking protocol used on the ARPANET was the Network Control Program.
- In 1983, it was replaced with the TCP/IP protocol.
- In 1993 first graphical browser Mosaic was developed.

Networks

- Intranet
  - An intranet is a set of networks, using the Internet Protocol and IP-based tools such as web browsers and file transfer applications, that is under the control of a single administrative entity.
- Extranet
  - An extranet is a network that is limited in scope to a single organization or entity and also has limited connections to the networks of one or more other usually, but not necessarily, trusted organizations or entities— a company's customers may be given access to some part of its intranet—while at the same time the customers may not be considered trusted from a security standpoint.
- Technically, an extranet may also be categorized as a LAN, MAN, WAN, or other type of network, although an extranet cannot consist of a single LAN; it must have at least one connection with an external network.

Websites

A- Internet Web Sites: Internet Web Site is traditional Web sites that are intended for access by the general public.

B- Intranet Web Sites: Intranet Web Site is intended only for internal (intraorganizational) use.

C- Extranet Web Sites: Extranet Web Site is a combination of these. They are typically private and secured areas for the use of an organization and it is designated partners.

Extranet

Intranet

Internet
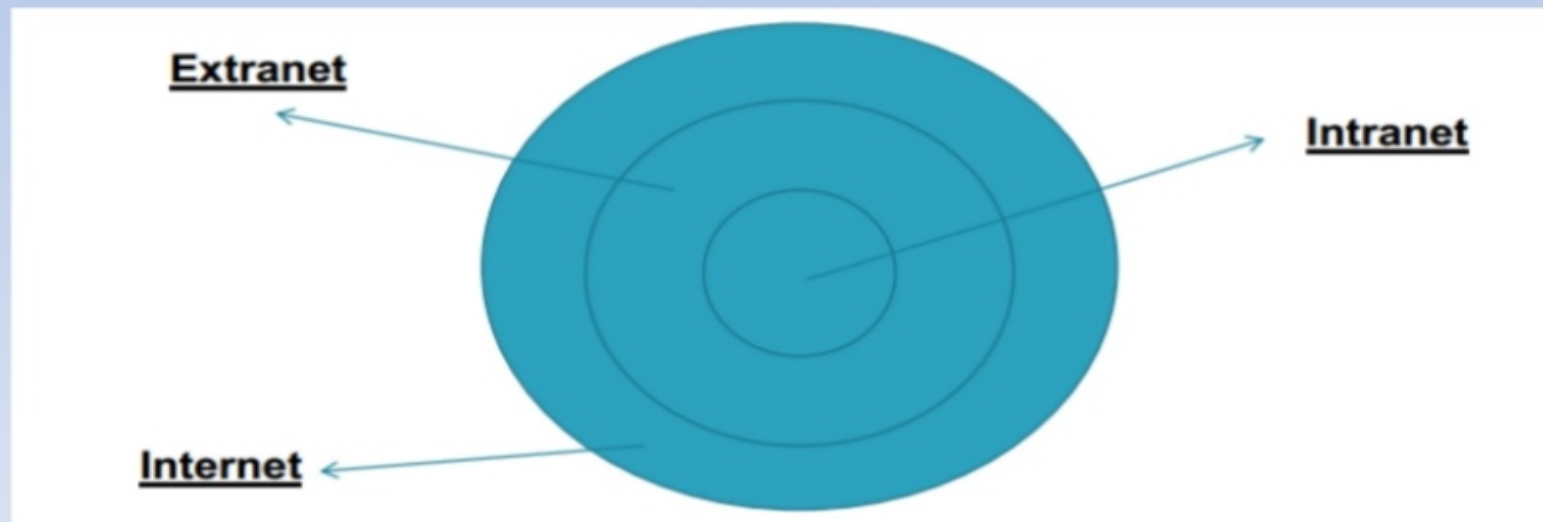
# The components of web application
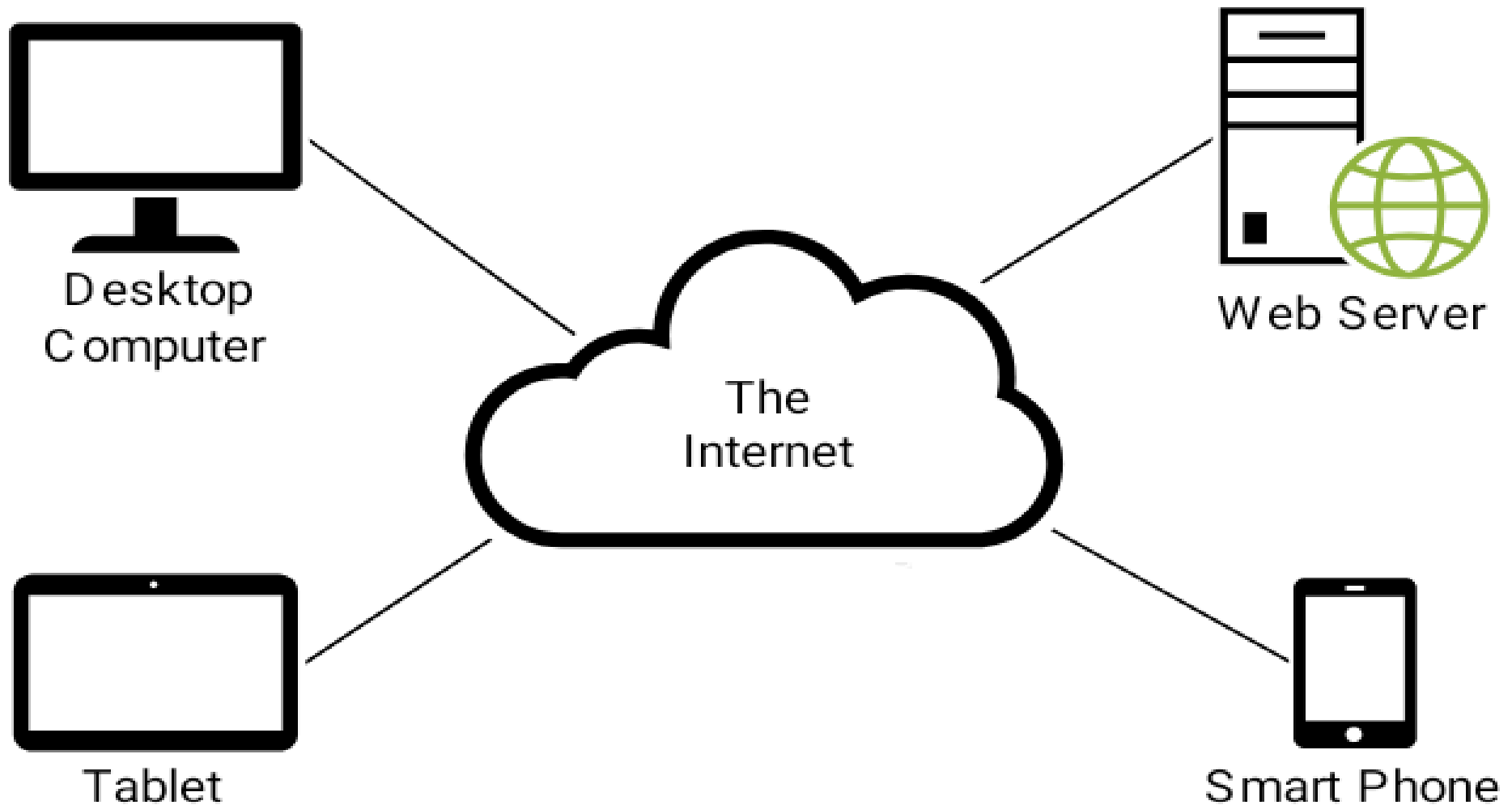
The components of web application

- Web Server
  - A web server is a computer program that delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol (HTTP), over the World Wide Web. The term web server can also refer to the computer or virtual machine running the program.
  - The primary function of a web server is to deliver web pages to clients. This means delivery of HTML documents and any additional content that may be included by a document, such as images, style sheets and JavaScript's.

The components of web application

- Web Browser
  - A web browser or Internet browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web.
  - An information resource is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video, or other piece of content.
  - Although browsers are primarily intended to access the World Wide Web, they can also be used to access information provided by Web servers in private networks or files in file systems. Some browsers can also be used to save information resources to file systems.

- A client, commonly a web browser or web crawler, initiates communication by making a request for a specific resource using HTTP and the server responds with the content of that resource, or an error message if unable to do so.

The architecture of the Internet
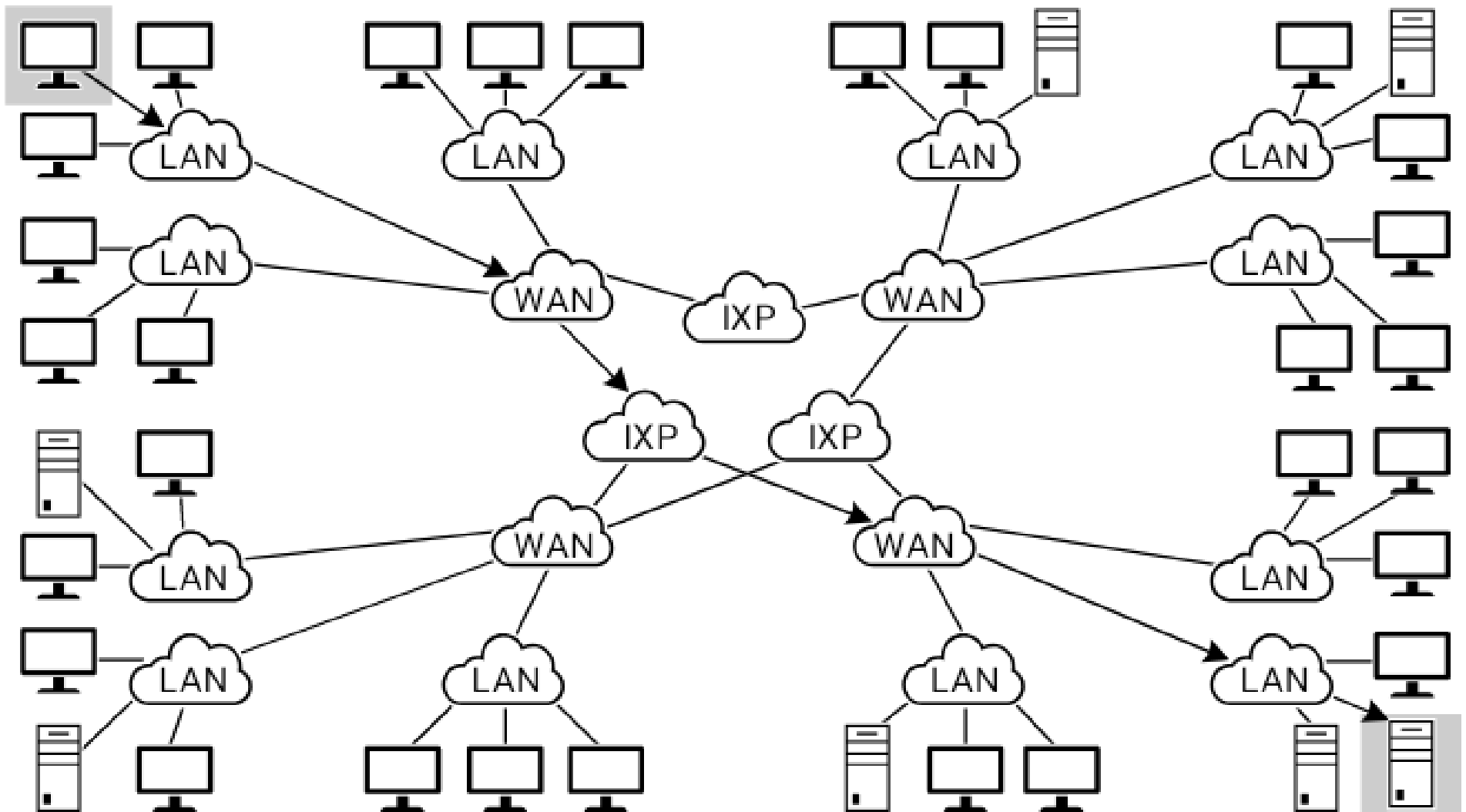
Client-server model

- The client–server model of computing is a distributed application structure that partitions tasks or workload between the providers of a resource or service, called servers, and service requesters, called clients. Often clients and servers communicate over a computer network on separate hardware, but both client and server may reside in the same system. Server is running one or more server programs which share their resources with clients. A client does not share any of its resources, but requests a server's content or service. Clients therefore initiate communication sessions with servers which await incoming requests.
-     Client- Server Paradigm
- Server application is ``listener"
- Waits for incoming message
- Performs service
- Returns results
- Client application establishes connection
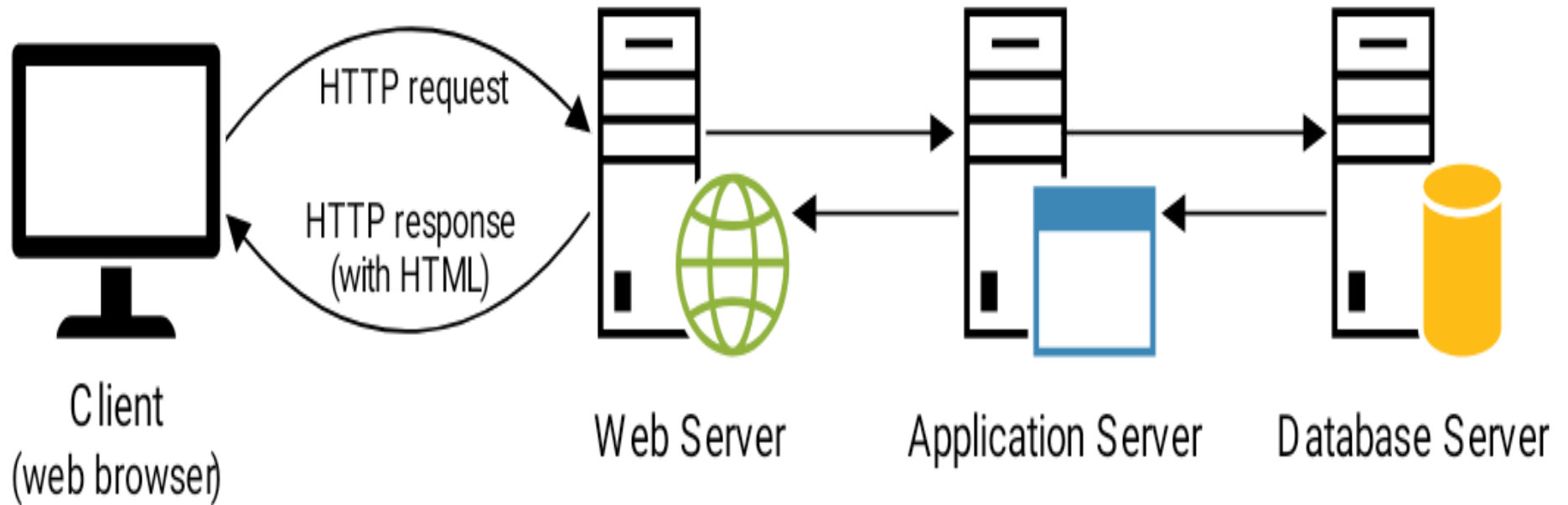- Sends message to server
- Waits for return message

Types of websites

1 - Static website

2 - Dynamic website

How a web server process a static web pages
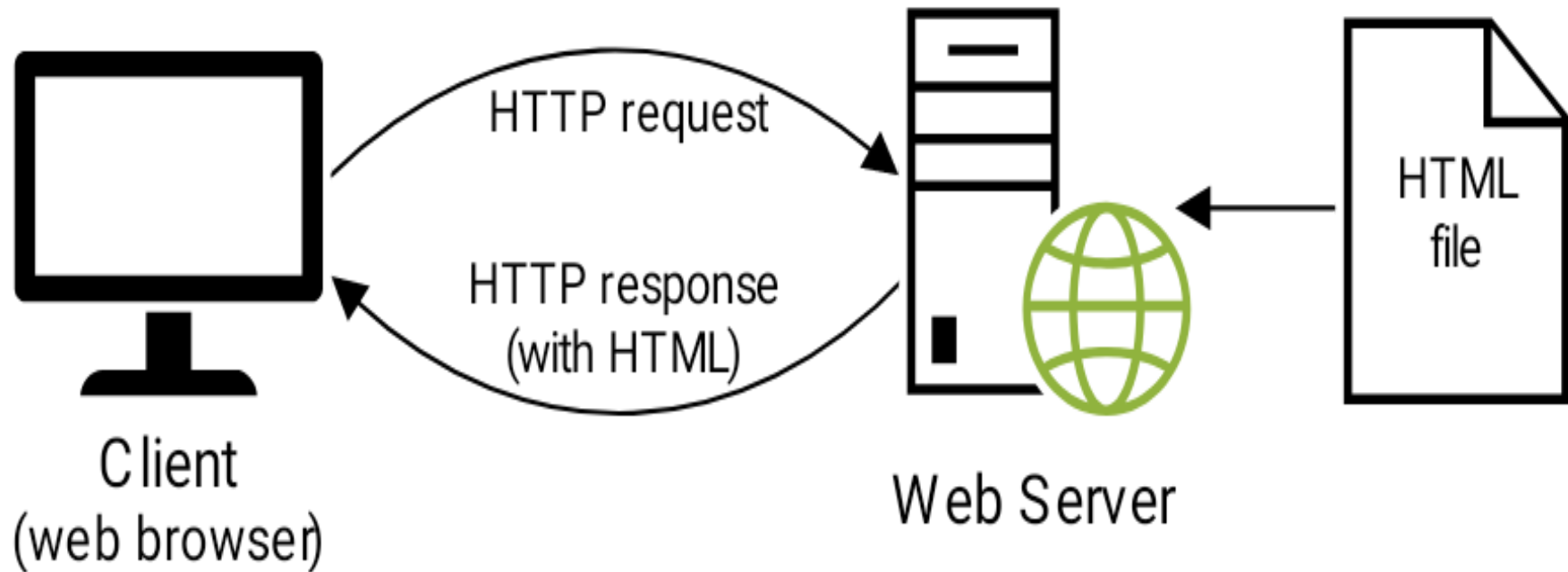
How a web server process a dynamic web pages

Services provided by the internet

- Web Sites : Documents that can be accessed on The Internet using a browser.
- Search Engines : Allows to find information on The Internet.
- E-commerce : Allows inline shopping, stock trading and auctioning.
- E-mail : Allows to send messages to others for later reading.
- Upload and Download : Allows to move or copy files to and from remote computers.
- Chat and Instant Messaging : Allows messages to be instantly sent to one or more People.
- Internet Telephony: Allows two or more people to communicate over the internet as if they were talking over the phone.
- Broadcasting : Allows us to watch/listen television/radio broadcasts on our computer.
- Remote Access and Control : Allows one computer to control the actions of another.

Features of a Website

- Home page: this is the beginning page of the site that appears when visiting a URL address. It contains links that take you to specific areas within the site and buttons to help you navigate the site.
- Webpage: A webpage is a document or information resource that is suitable for the World Wide Web and can be accessed through a web browser and displayed on a monitor or mobile device. This information is usually in HTML or XHTML format, and may provide navigation to other webpages via hypertext links. Webpages contain other resources such as style sheets, scripts and images.
- Link: A link or hyperlink is a connector that provides connections and makes it possible to go to another web page on the site or on the internet. A hyperlink points to a whole document or to a specific element within a document.
- Banner: A banner is a graphic display on a web page, usually used for advertising. The banner is usually linked to the advertisers web page.

Domain Name System

- The Domain Name System (DNS) is a hierarchical naming system built on a distributed database for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most importantly, it translates domain names meaningful to humans into the numerical identifiers associated with networking equipment for the purpose of locating and addressing these devices worldwide.

- An often-used analogy to explain the Domain Name System is that it serves as the phone book for the Internet by translating human-friendly computer hostnames into IP addresses. For example, the domain name www.yahoo.com translates to the addresses 87.248.122.122 (IPv4).

Web browsers

- Mozilla Firefox
- Google Chorme
- Opera
- Safari
- Internet explorer

Server-side scripting languages

- Php
- Perl
- Python
- Jsp
- Asp. Net

Popular IDEs for web development

- Visual code
- Adobe Dreamweaver
- Eclipse
- NetBeans
- Microsoft Visual studio

The components of HTTP URL

http://www.modulemedia.com/ourwork/index.html

| protocol | domain name | path | filename |

The components of HTTP URL

http://www.modulemedia.com/ourwork/index.html

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Protocols determine network language
Usually http or https for web browsers

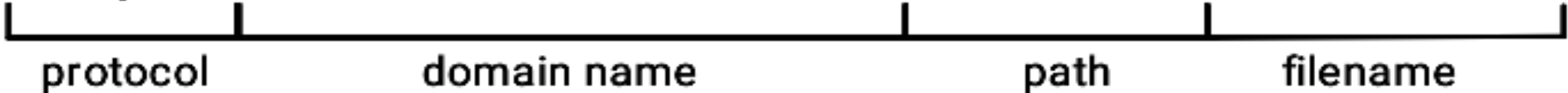Other Common Protocols:
    https:// (secure)
    ftp://   (file transfer)
    mailto:// (e-mail address)
    file:// (local files)

The components of HTTP URL

ht t p: / / www. modul emedi a com/ our wor k/ i ndex. ht ml

| protocol | domain name | path | filename |

Subdomains
    www (web server, sometimes optional)
    ftp (file server)
    en ("English" on Wikipedia)
    www.cs ("Computer Science", "web" at Pitt)

Top-Level Domains (TLD)
    .com, .org, .net, .gov, .mil
    .us, .ca, .uk, .jp
    newer ones: .biz, .info, …

Several Top-level domains are common:

com: commercial enterprise.

edu: educational institution.

gov: government entity.

mil: military entity.

net: network access provider.

org: usually nonprofit organizations

Internet Service Provider (ISP): Provides access to the Internet along with other types of services such as e-mail.

HyperText Transfer Protocol (HTTP): to transmit data Protocols for other Internet applications

Naming recommendations for folders and files

- Create names for folders and files that consist of lowercase letters, numbers, underscores or hyphens, and the period.

- Use filenames that clearly indicate what a page contains. This is good for search engine optimization.

What web site users want

- To find what they're looking for as quickly and easily as possible

- To get information or do a task as quickly and easily as possible

Four guidelines for improving usability

- Present as much critical information as possible "above the fold".

- Group related items and limit the number of groups on each page.

- Include a header that identifies the site and provides a navigation bar and links to utilities.

- Use current navigation conventions, like including a logo that goes to your home page when clicked and a cart icon that goes to your shopping cart when clicked.

Guidelines for cross-browser compatibility

 Test your web pages on all of the major browsers, including older versions of Internet Explorer that are still in common use.

 Use the HTML5 and CSS3 features that are supported by most modern browsers, which are the features that are presented in this book. But use the workarounds so those features will work in all browsers still in use.

What is responsive design?

- Responsive Web Design refers to websites that are designed to adapt gracefully to the screen size.

- Typically, the overall look-and-feel of a website will remain consistent from one screen size to the next.

- Media queries, scalable images, and flexible layouts are the backbone of Responsive Web Design.

Any Questions?