INTERNET OVERVIEW

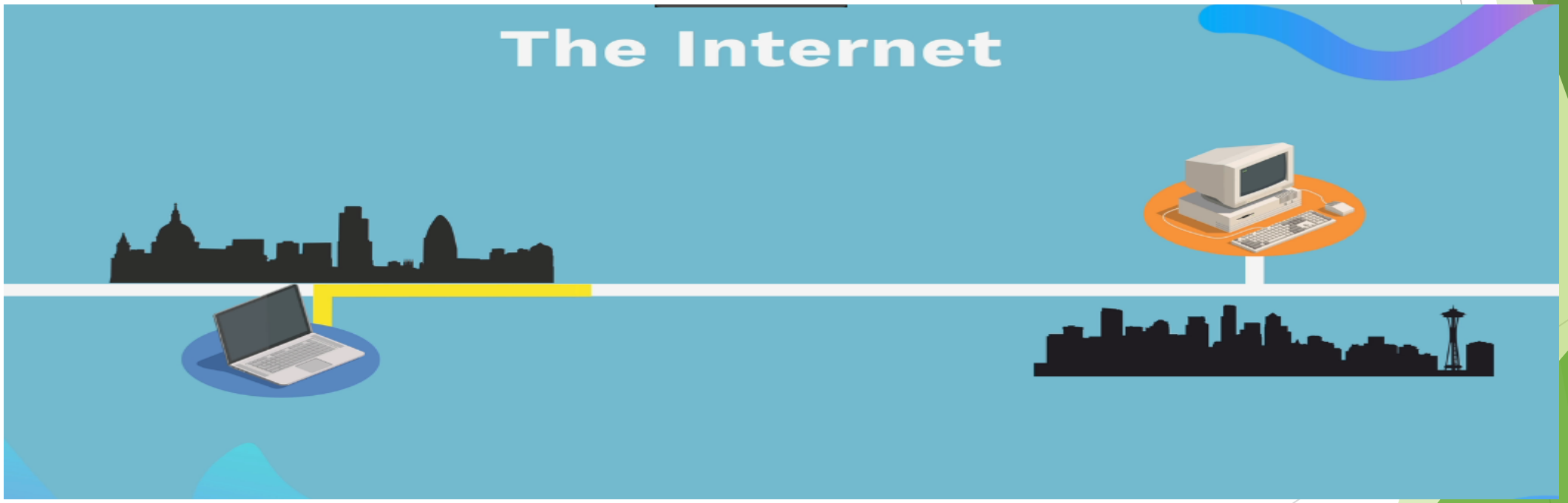
ASP.NET Web OVERVIEW

Objectives

Knowledge

1. Internet and Network overview
2. Client Server environment
3. ASP.Net overview
4. What is .Net and Its Framework
5. Describe the components of a web application.
6. Describe the four components of a URL,
7. Distinguish between static and dynamic web pages, with the focus on the web server, application server, and database server.
8. Describe these terms: HTTP request, HTTP response, and round trip.
9. Distinguish between ASP.NET Web Forms applications and MVC applications.


DOS
PCs
Internet


The Internet

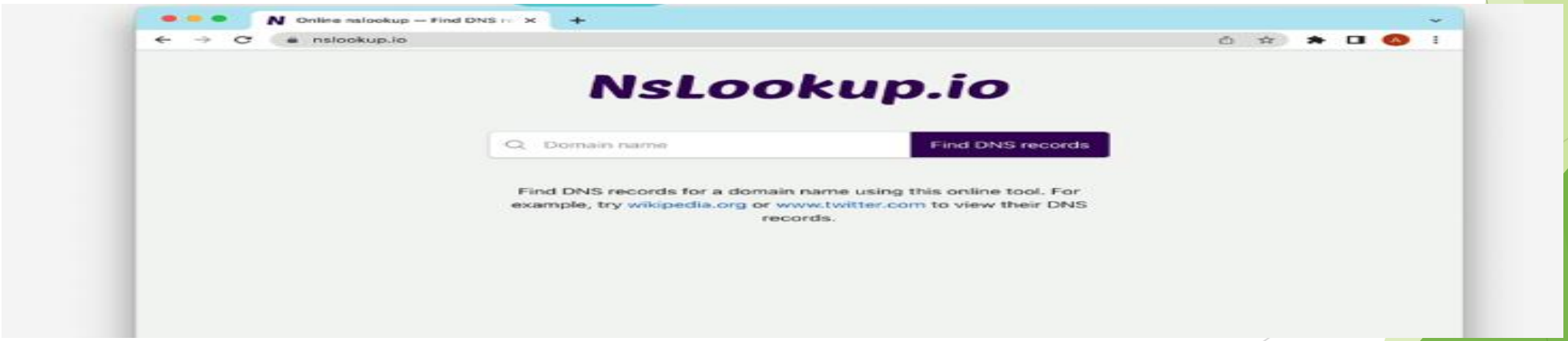
Client Server Environment

Client Server Environment

Processing User request

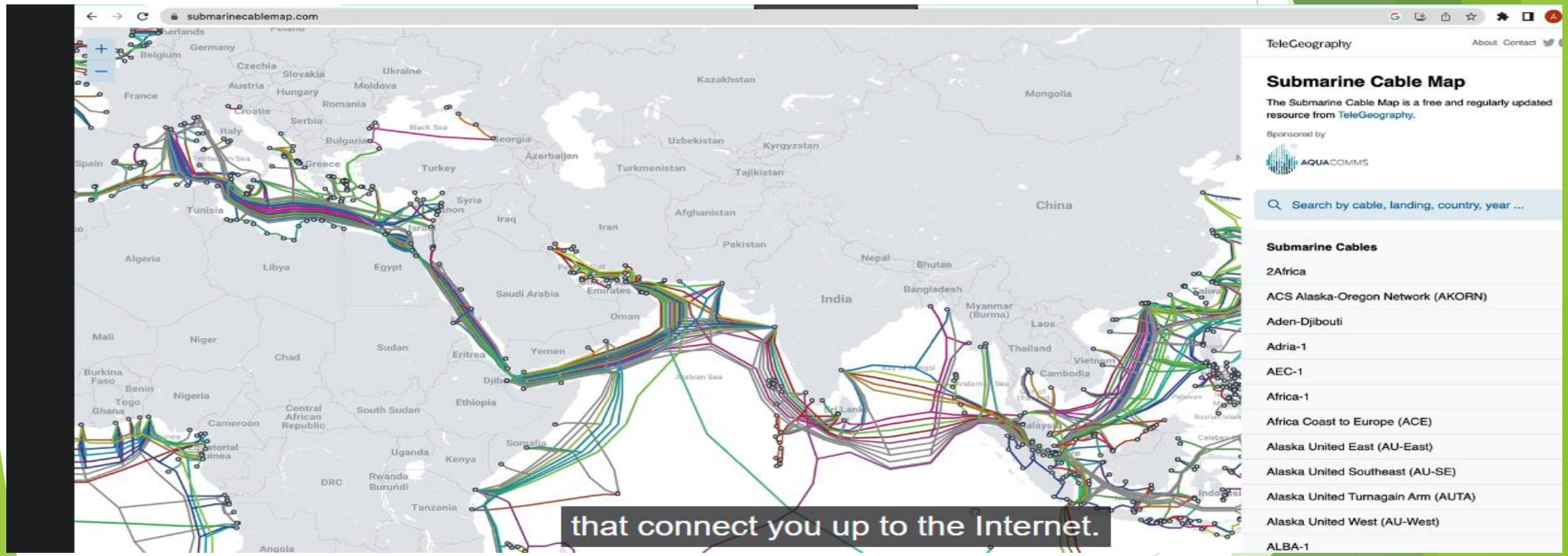
IP address

Instead of the transition process through the DNS to find the IP address you may use directly a website called NSLOOKUP.IO and type in Google.com and it should show you the Exact IP address of the Google Website. Copy it and paste it into a new tab then You'll be able to replicate that process.



Ocean Map

The Internet Wire connect the world through the oceans. a Map can show you these connectivity's .



W W W

As we mention previously, The World Wide Web is a Giant library that contains billions of documents called Web pages.

A Web site is a related collection of Web pages. You can access and view these web pages using a software program called a Web browser. Each Web page has a unique address called a Uniform Resource Locator (URL)

protocol domain name

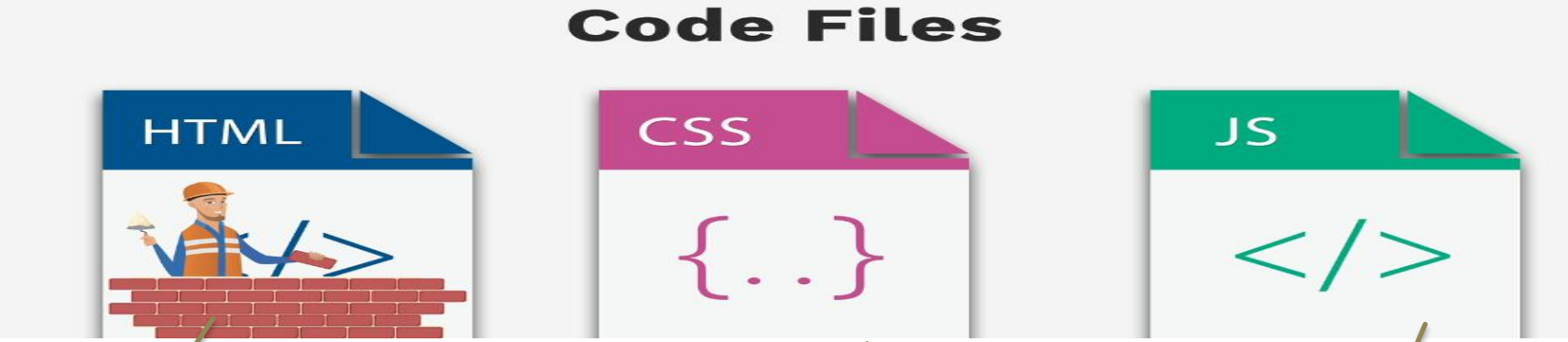
http:// www.usatoday.com/

Once the DNS server find the IP address of the website requested, then all the files and Data will be sent to the user browser to be able to render on the screen.

Usually, the data received from the server consists of Three types of files :

HTML CSS and JavaScript

Let's see what is their roles On a Webpage



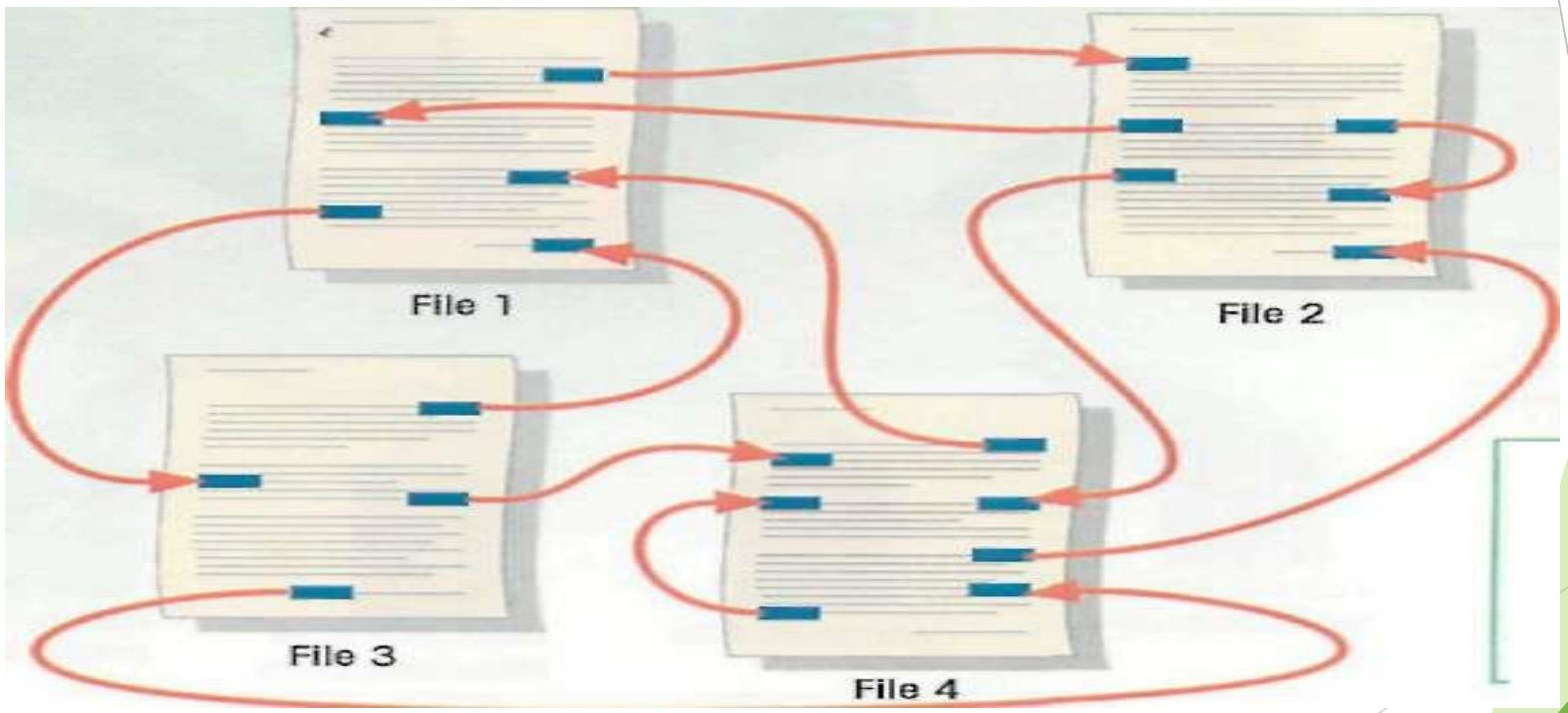
So, Imagine if a website was a house , then the HTML would be the Bricks of that house

The second type of files are the CSS files and these are responsible for styling your website

The final component is the JavaScript code that allows your website to have functionality ,

Hypertext, Links, and Hypermedia

The public files on Web servers are ordinary text files, much like the files used by word-processing software. To allow Web browser software to read them, however, the text must be formatted according to a generally accepted standard. The standard used on the Web is Hypertext Markup Language **(HTML).**



HTML

```
<!DOCTYPE HTML>
<html>
<head>
<title> Title of the document</title>
</head>

<body>
The content of the document......
</body>

</html>
```

link

```
<a href="http://www.w3schools.com">Visit W3Schools.com!</a>
```

ASP.NET Web OVERVIEW

Microsoft .NET Framework

What is .NET?

The key features that .NET offers include:

.NET Platform: The .NET platform includes the .NET Framework and tools **to build and operate services, clients, and so on**. **ASP.NET** part of the .NET Framework.

.NET Products: .NET products currently among others include MSN.NET, Office.NET, Visual Studio.NET, and Windows .NET Server.

Microsoft .NET Framework

This suite provides developers with a friendly, usable environment in which they may create applications with a range of programming languages including C++. NET, Visual Basic.NET, ASP.NET, and C#. in the same application.

They all share key components. Application are created using drag and drop of existing building block (predefined object)

All issues are being taken care by the framework implicitly.

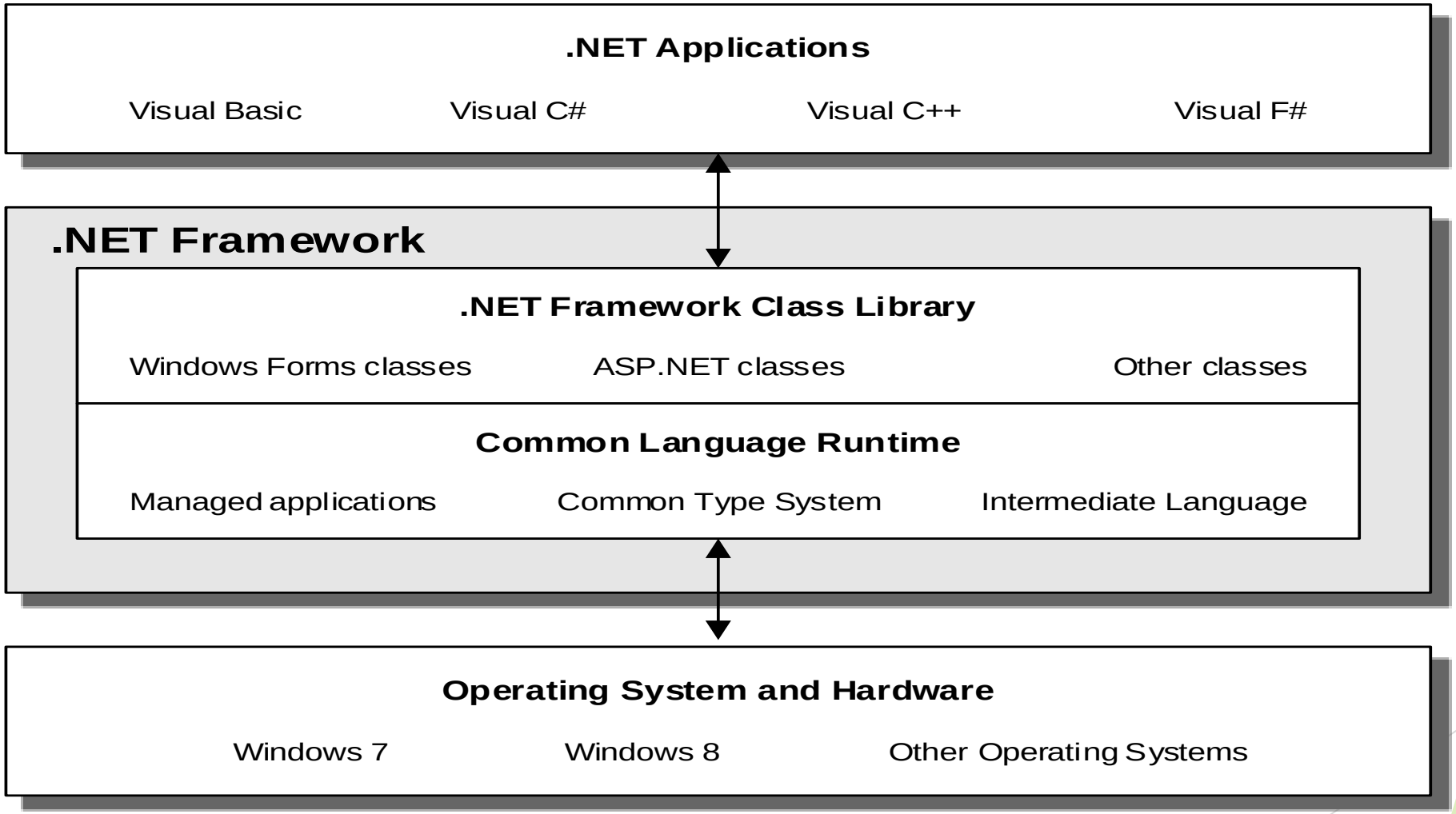
Microsoft .NET Framework

The **.NET Framework** (pronounced as "*dot net*") is a proprietary software framework developed by Microsoft that runs primarily on Microsoft Windows. It was the predominant implementation of the Common Language Infrastructure (CLI) until being superseded by the cross-platform .NET project.

It includes a large class library called Framework Class Library (FCL) and provides language interoperability (each language can use code written in other languages) across several programming languages.

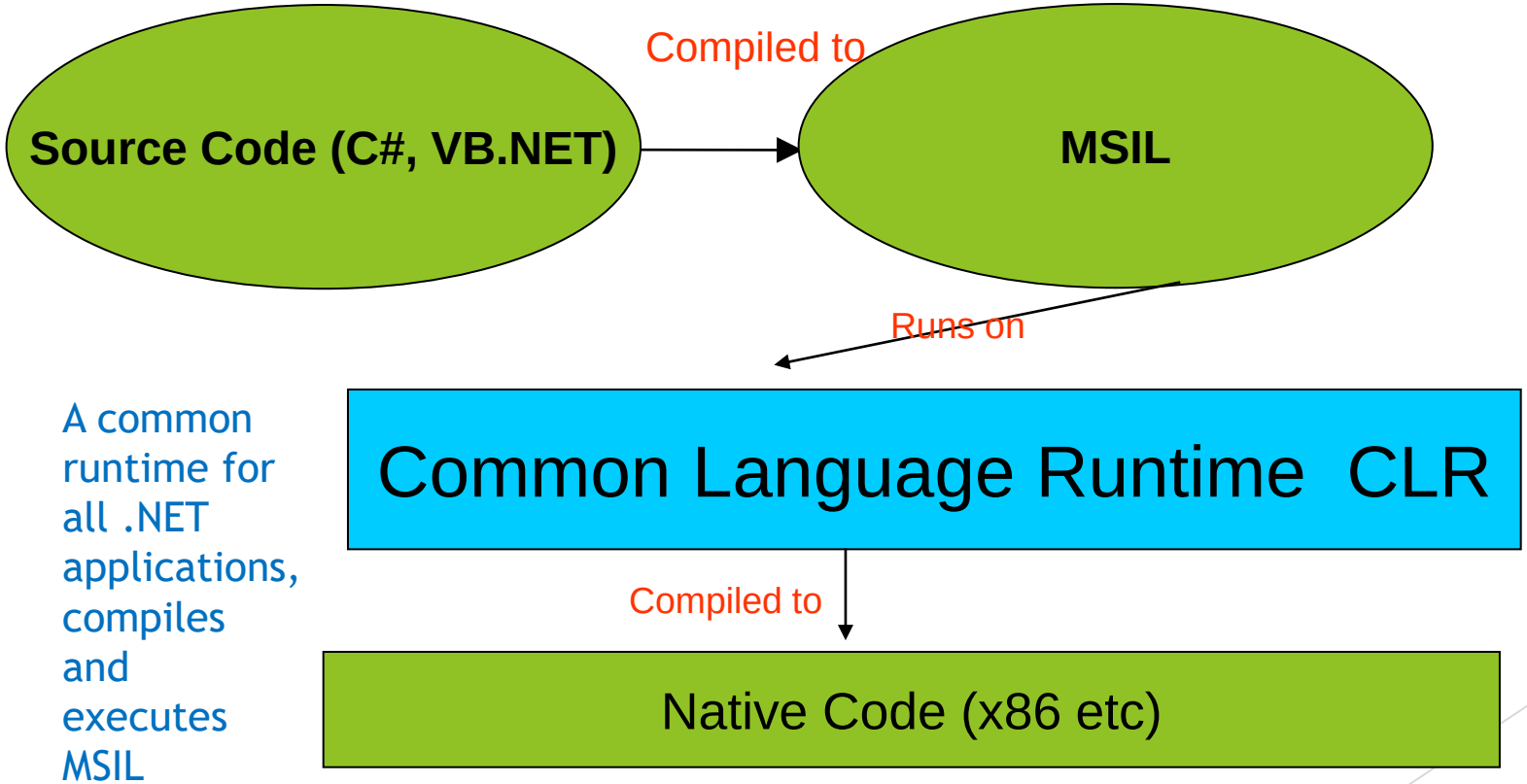
Programs written for .NET Framework execute in a software environment (in contrast to a hardware environment) named the Common Language Runtime (CLR).

Microsoft .NET Framework



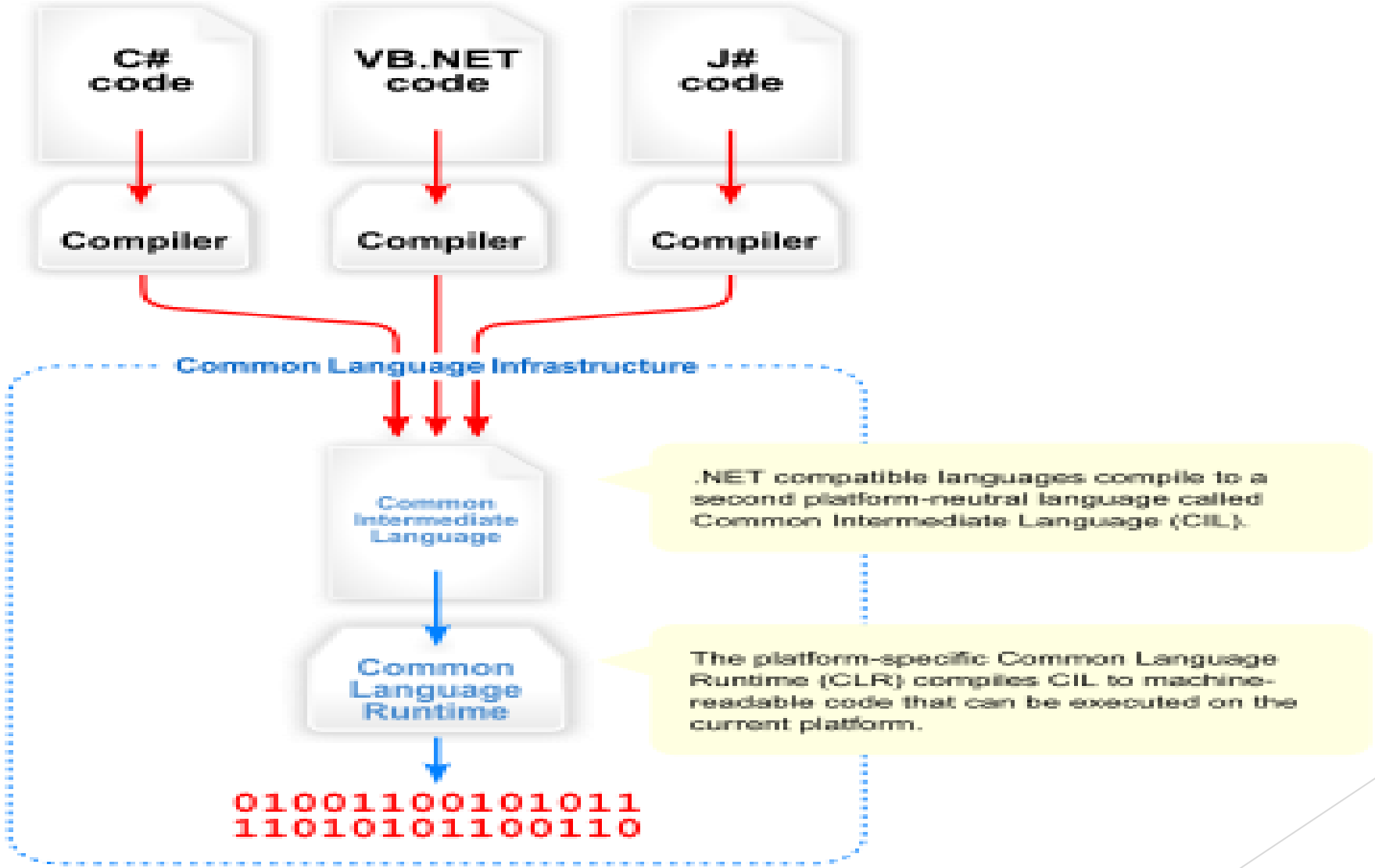
Targeting .NET

Microsoft Intermediate Language
platform independent, low-level,
stack-based assembly-like language



A common runtime for all .NET applications, compiles and executes MSIL

Microsoft .NET Framework



What is ASP.NET?

ASP.NET is a server-side technology for developing Web applications based on the Microsoft .NET Framework. And run on the Web server.

- **In the old Time: (before the Dinosaur)**

- Most Web designers start by learning client-side technologies like HTML, JavaScript, and Cascading Style Sheets (CSS).
- **When a Web browser requests** a Web page created with client-side technologies, the Web server simply grabs the files that the browser (the client) requests and sends them down the line.
- **The client** is entirely responsible for reading the code in the files and interpreting it to display the page on the screen.

- Server-side technologies, like ASP.NET, are different. Instead of being interpreted by the client, It is interpreted by the Web server.
- the code in the page is read by the server and used dynamically to generate standard HTML/JavaScript/CSS that is then sent to the browser.

.NET Framework

Microsoft's ASP.NET is the part of the .NET Framework that enables you to build rich, dynamic web applications. ASP.NET has it's roots in classic ASP (Active Server Pages) that was introduced back in 1996 and has evolved into the current version, ASP.NET 6.

ASP.NET is an extremely popular technology currently in use on over 25 million websites around the world and has been used by companies like Google, Dell Computer and Myspace.

ASP.NET offers four programming models to build websites ranging from single-page sites up to large, enterprise web applications.

ASP.NET 4.x

ASP.NET 4.x is a mature framework that provides the services needed to build enterprise-grade, server-based web apps on Windows.

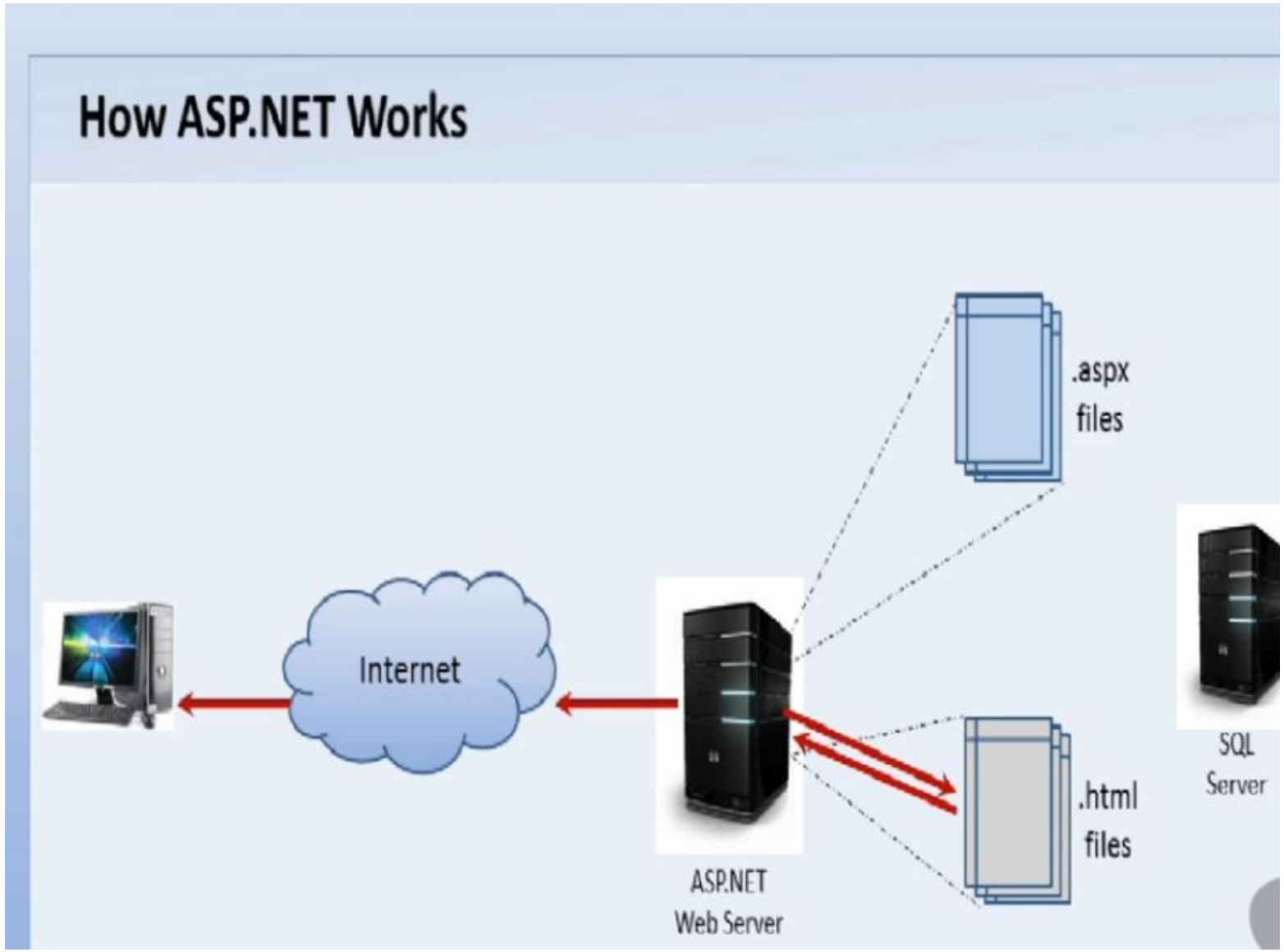
Framework selection

The following table compares ASP.NET Core to ASP.NET 4.x.
See ASP.NET Core targeting .NET Framework for information on ASP.NET Core 2.x support on .NET Framework.

Framework selection

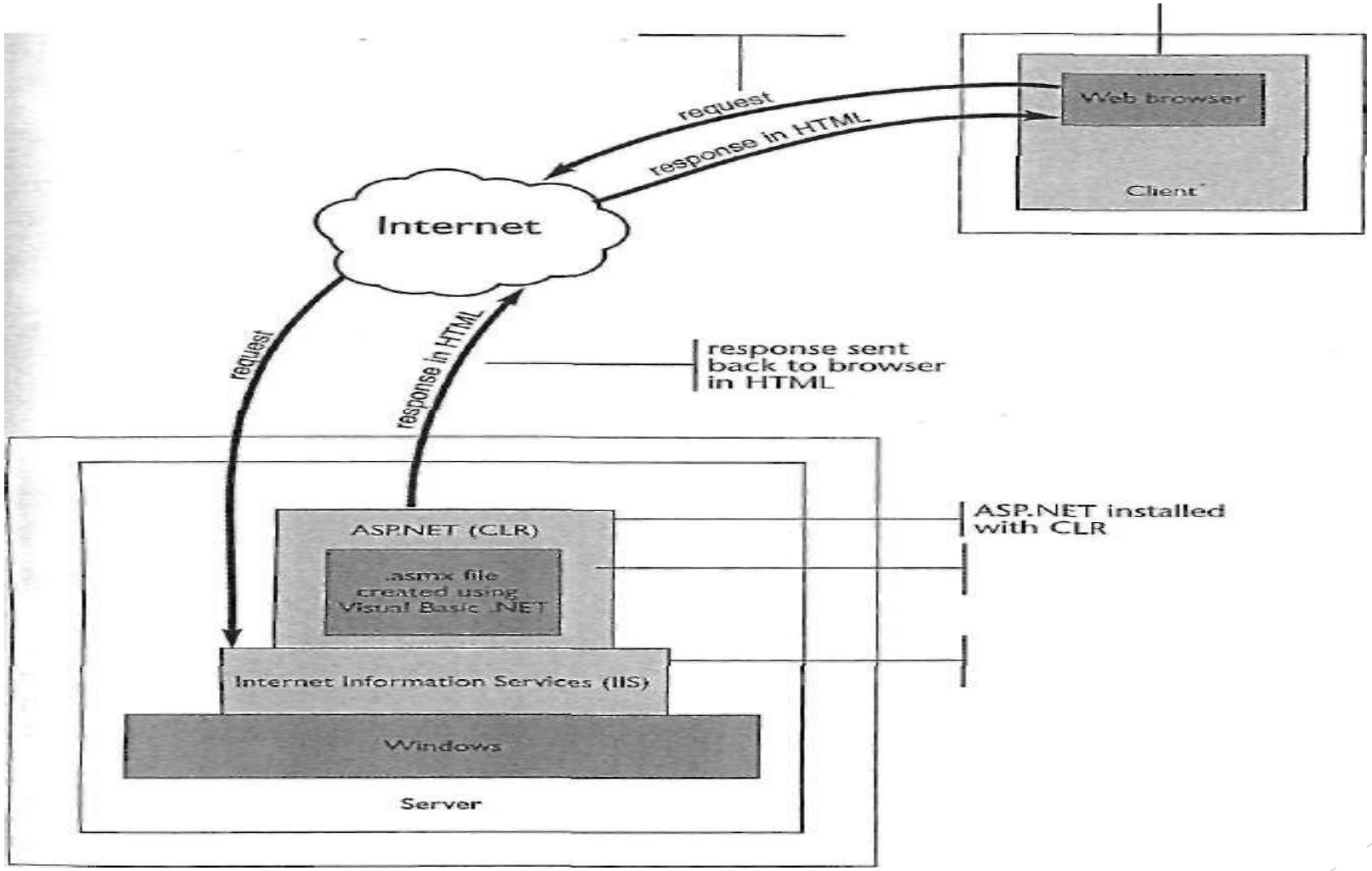
The following table compares ASP.NET Core to ASP.NET 4.x.

ASP.NET Core	ASP.NET 4.x
Build for Windows, macOS, or Linux	Build for Windows
Razor Pages is the recommended approach to create a Web UI as of ASP.NET Core 2.x. See also MVC, Web API, and SignalR.	Use Web Forms, SignalR, MVC, Web API, WebHooks, or Web Pages
Multiple versions per machine	One version per machine
Develop with Visual Studio, Visual Studio for Mac, or Visual Studio Code using C# or F#	Develop with Visual Studio using C#, VB, or F#
Higher performance than ASP.NET 4.x	Good performance
Use .NET Core runtime	Use .NET Framework runtime


How ASP.NET Works
.aspx
files
Internet
SQL
Server
.html
files
ASP.NET
Web Server

request sent
over Internet
or network

Web browser on client makes request



what makes ASP.NET so good? Compared with other options for building Web applications, ASP.NET has the following advantages:

ASP.NET lets you use your favorite programming language, or at least one that's really close to it. The .NET Framework currently supports over twenty languages, four of which may be used to build ASP.NET Websites.

ASP.NET pages are *compiled*, not interpreted. Instead of reading and interpreting your code every time a dynamic page is requested, ASP.NET compiles dynamic pages into efficient binary files that the server can execute very quickly. This represents a big jump in performance when compared with the technology's interpreted predecessor, ASP.

Programming Languages

- Structured Programming a technique for organizing and coding computer programs in which a downward hierarchy of modules is used,
- Procedural
  - Program specifies exact sequence based on actions or verbs
  - Pascal ,Fortran
- Object Oriented Programming (VB.NET Or C.NET)
  - User controls sequence
    - Click event
    - Double Click event
    - Change event

VB.NET and C.NET are object-oriented event driven Visual programming language in which program are created using a software tools called IDE (integrated development environment).

Application are created using drag and drop of existing building block (predefined object).

Websites and web applications

- ASP.NET offers three frameworks for creating web applications:
  - Web Forms,
  - ASP.NET MVC,
  - and ASP.NET Web Pages.

- All three frameworks are stable and mature, and you can create great web applications with any of them. No matter what framework you choose, you will get all the benefits and features of ASP.NET everywhere.

Websites and web applications

Each framework targets a different development style. The one you choose depends on a combination of your programming assets (knowledge, skills, and development experience), the type of application you're creating, and the development approach you're comfortable with.

Framework	If you have experience in	Development style	Expertise
Web Forms	Win Forms, WPF, .NET	Rapid development using a rich library of controls that encapsulate HTML markup	Mid-Level, Advanced RAD
MVC	Ruby on Rails, .NET	Full control over HTML markup, code and markup separated, and easy to write tests. The best choice for mobile and single-page applications (SPA).	Mid-Level, Advanced
Web Pages	Classic ASP, PHP	HTML markup and your code together in the same file	New, Mid-Level

Websites and web applications

MVC (model view controller) application is broken into components ex. One deal with database connection, one deal with communications…. It enables code reuse. Used for large, commercial applications build by teams.

It required more development works than web forms development which is a rapid application development.

Websites and web applications

Web Forms
With ASP.NET Web Forms, you can build dynamic websites using a familiar drag-and-drop, event-driven model. A design surface and hundreds of controls and components let you rapidly build sophisticated, powerful UI-driven sites with data access.

MVC
ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and that gives you full control over markup for enjoyable, agile development. ASP.NET MVC includes many features that enable fast, TDD-friendly development for creating sophisticated applications that use the latest web standards.

ASP.NET Web Pages
ASP.NET Web Pages and the Razor syntax provide a fast, approachable, and lightweight way to combine server code with HTML to create dynamic web content. Connect to databases, add video, link to social networking sites, and include many more features that help you create beautiful sites that conform to the latest web standards.

Websites and web applications

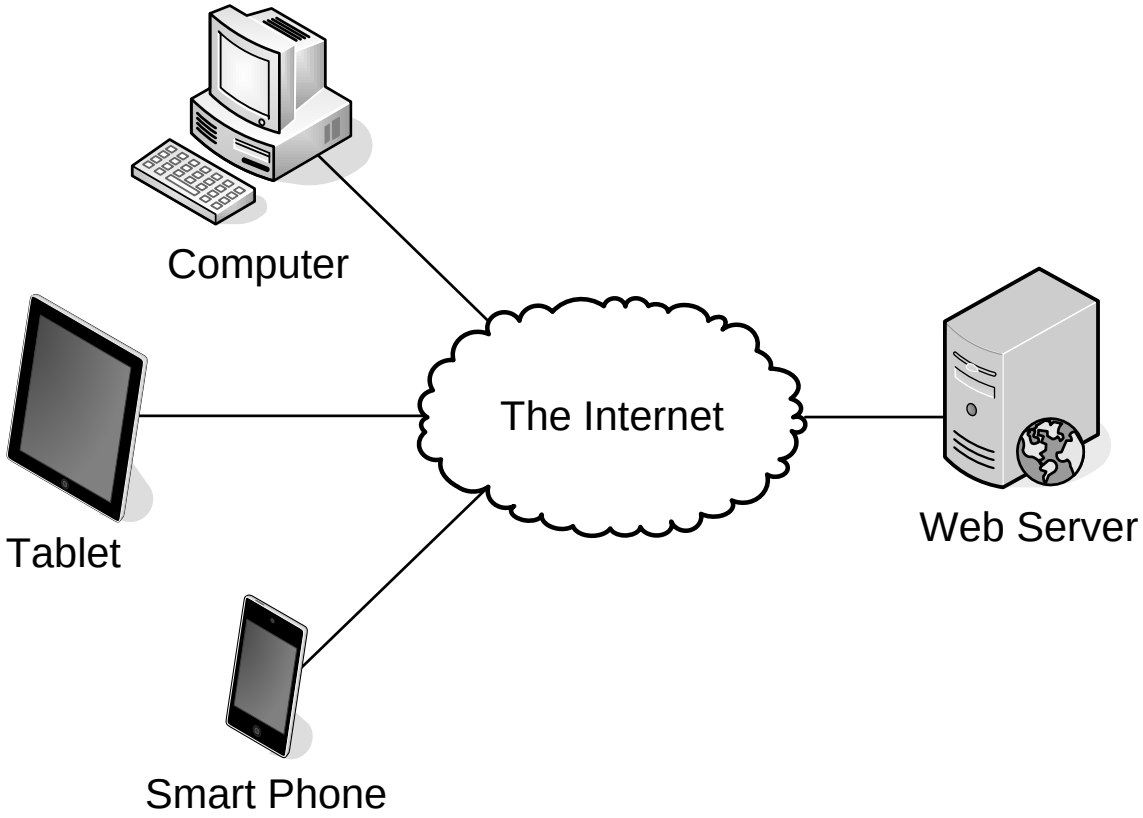
Notes about Web Forms, MVC, and Web Pages
All three ASP.NET frameworks are based on the .NET Framework and share core functionality of .NET and of ASP.NET.

For example, all three frameworks offer a login security model based around membership, and all three share the same facilities for managing requests, handling sessions, and so on that are part of the core ASP.NET functionality.

In addition, the three frameworks are not entirely independent, and choosing one does not preclude using another. Since the frameworks can coexist in the same web application, it's not uncommon to see individual components of applications written using different frameworks.

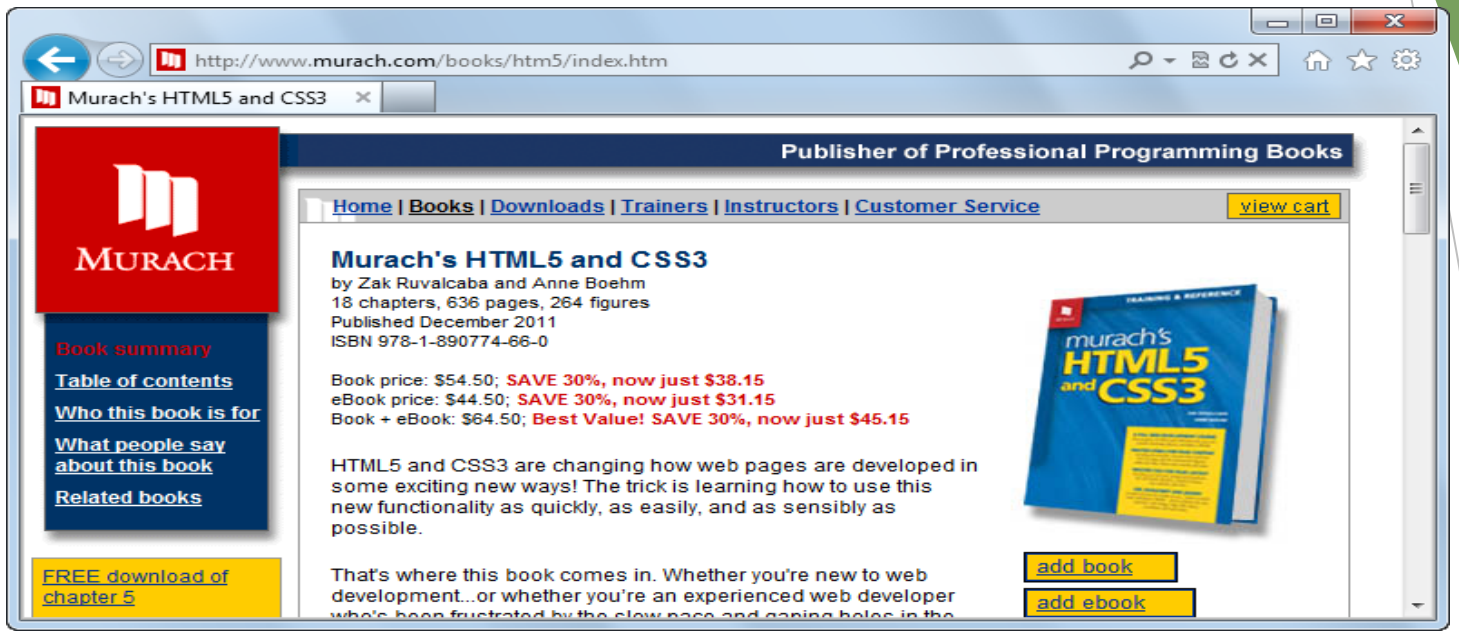
For example, customer-facing portions of an app might be developed in MVC to optimize the markup, while the data access and administrative portions are developed in Web Forms to take advantage of data controls and simple data access.

The components of a web application



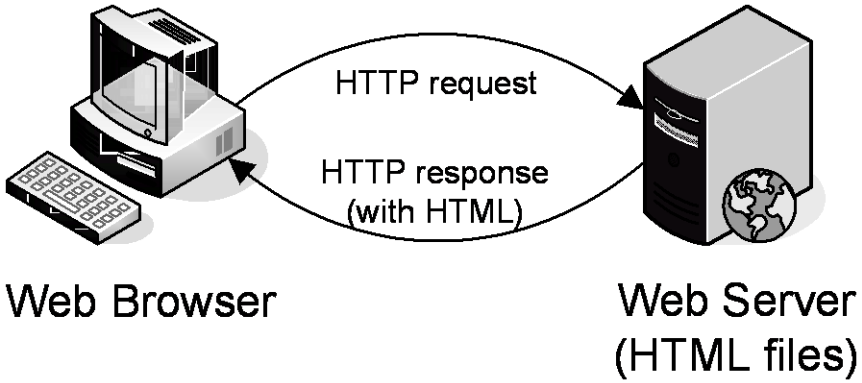
Client access web page through a web browser. The web server hold up the pages of the web applications.

A static web page



Address never change has extension .htm or .html

How a web server processes a static web page



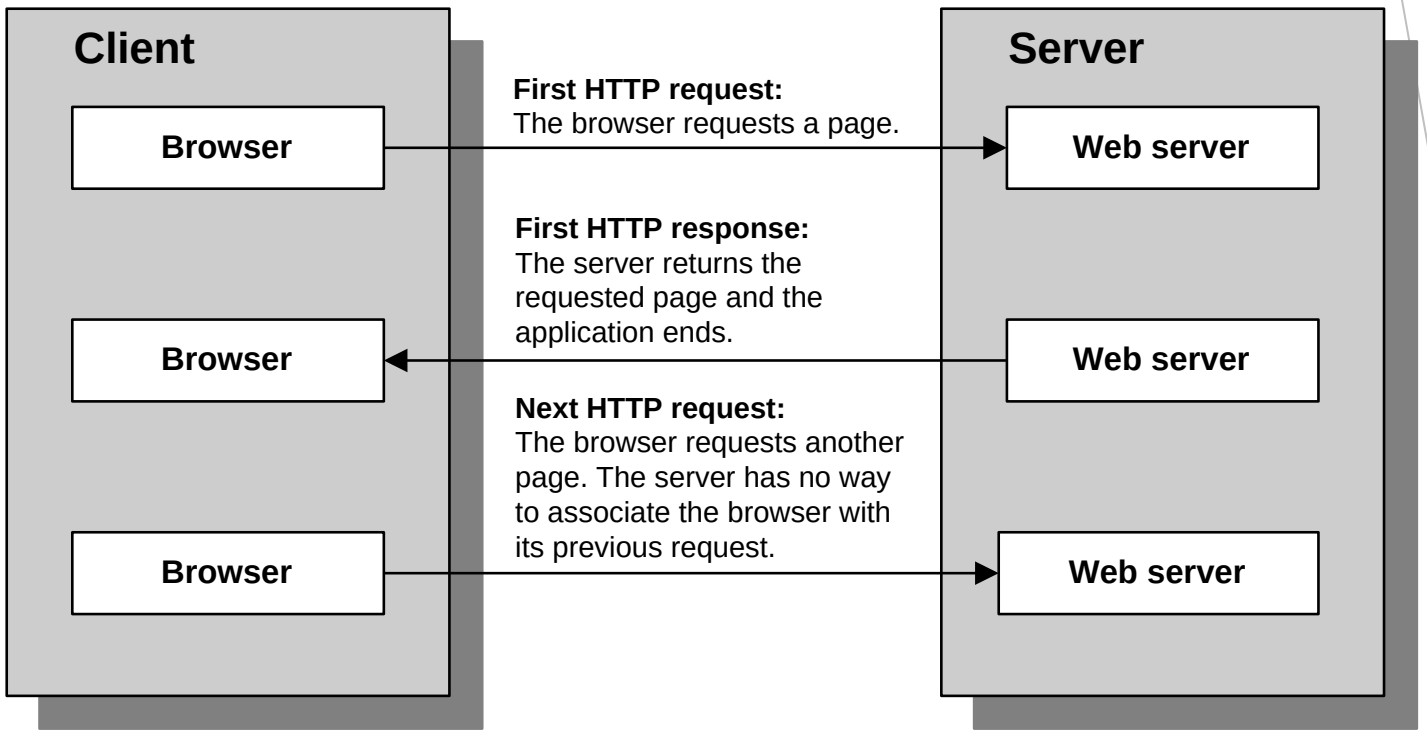
A Web browser build a request for the web page and send it to the server, The request known as an HTTP request is formatted using Hypertext Transfer protocol, Which lets the web server know which file is being requested.

When the web server receives the HTTP request, it retrieves the requested file from the disk drive. This file contains the HTML for the requested page.

Then, **the web server sends the HTML back to the browser** as part of an HTTP response.

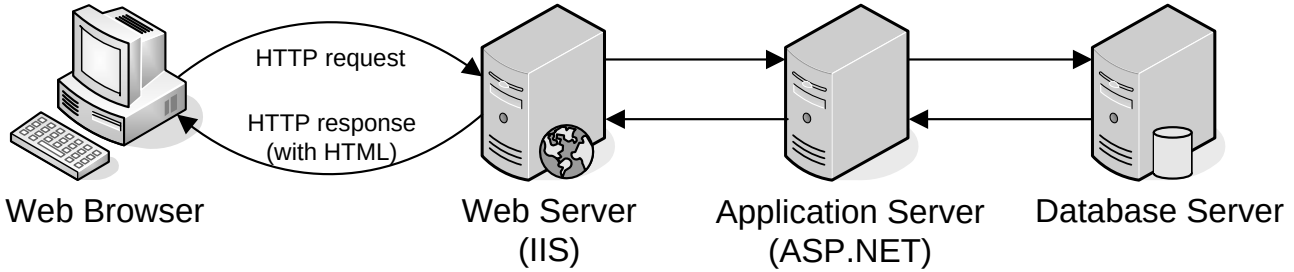
When the browser receives the HTTP response, it RENDER(translates) the HTML into a web page that is displayed in the browser.

Each time user click will generate the same process.



HTTP is a stateless protocol (make one request receive one response and die) does not keep track or memorize info.

How a web server processes a dynamic web page



When you build ASP.net applications . IIS (internet Information services is used for the web server and ASP.net is used for the application server.

A dynamic page is a page created by a program on an application server (ex. ASP.net) and sent via an HTTP request to the server. The server program analyze and send the request to the appropriate app. server for processing.

ASP.NET compiles dynamic pages into efficient binary files that the server can execute very quickly.