CHAPTER 4

4. HTTP and the Web Services **8 Hrs.**

4.1 HTTP, Web Servers and Web Access

[Self Study]

4.2 Universal naming with URLs

[Self Study]

4.3 WWW Technology: HTML, DHTML, WML, XML

HTML

[Self Study]

Dynamic HTML, or **DHTML**, is an umbrella term for a collection of technologies used together to create interactive and animated web sites by using a combination of a static markup language (such as HTML), a client-side scripting language (such as JavaScript), a presentation definition language (such as CSS), and the Document Object Model.

WML

WML is an XML language used to specify content and user interface for WAP devices like PDA and Mobile Phones.

- WML stands for **W**ireless **M**arkup **L**anguage
- WML is an application of XML, which is defined in a document-type definition.
- WML is based on HDML and is modified so that it can be compared with HTML.
- WML takes care of the small screen and the low bandwidth of transmission.
- WML is the markup language defined in the WAP specification.
- WAP sites are written in WML, while web sites are written in HTML.
- WML is very similar to HTML. Both of them use tags and are written in plain text format.

- WML files have the extension ".wml". The MIME type of WML is "text/vnd.wap.wml".

Following is the basic structure of a WML program:

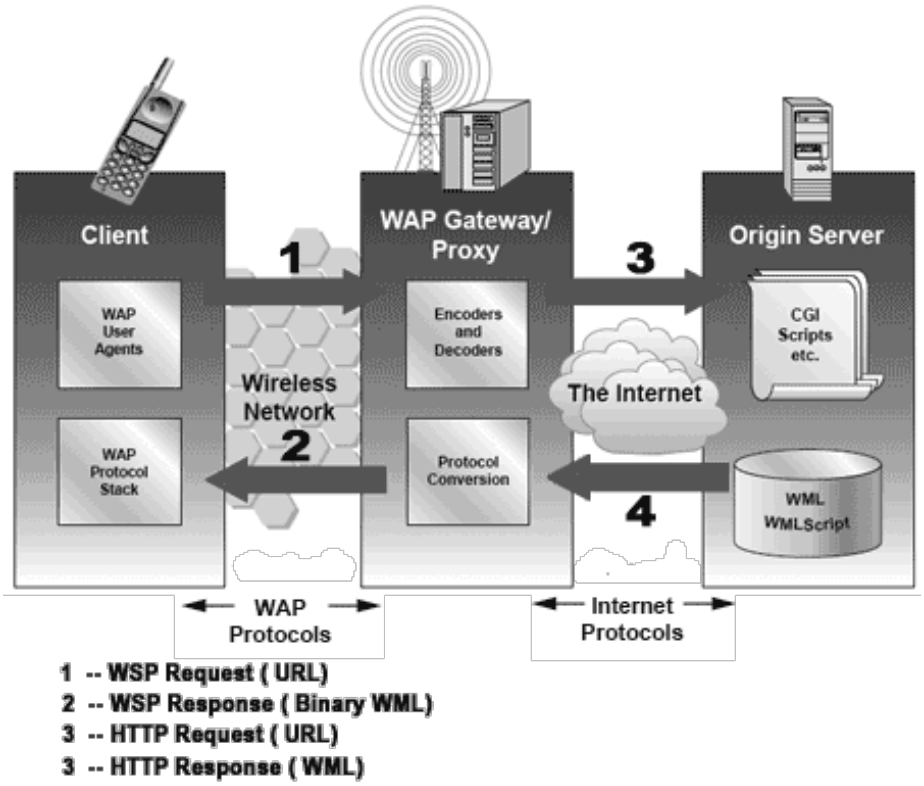
```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.2//EN"
"http://www.wapforum.org/DTD/wml12.dtd">

<wml>

<card id="one" title="First Card">
  <p> This is the first card in the deck </p>
</card>

<card id="two" title="Second Card">
  <p> Ths is the second card in the deck </p>
</card>

</wml>
```



When it comes to actual use, WAP works like this:

i. The user selects an option on their mobile device that has a URL with Wireless Markup language (WML) content assigned to it.

ii. The phone sends the URL request via the phone network to a WAP gateway, using the binary encoded WAP protocol.

iii. The gateway translates this WAP request into a conventional HTTP request for the specified URL, and sends it on to the Internet.

iv. The appropriate Web server picks up the HTTP request.

v. The server processes the request, just as it would any other request. If the URL refers to a static WML file, the server delivers it. If a CGI script is requested, it is processed and the content returned as usual.

vi. The Web server adds the HTTP header to the WML content and returns it to the gateway.

vii. The WAP gateway compiles the WML into binary form.

viii. The gateway then sends the WML response back to the phone.

ix. The phone receives the WML via the WAP protocol.

x. The micro-browser processes the WML and displays the content on the screen.

4.4 Tools: WYSIWYG Authoring Tools

What You See Is What You Get. A WYSIWYG editor is a system in which content (text and graphics) onscreen during editing appears in a form closely corresponding to its appearance when printed or displayed as a finished product,[2] which might be a printed document, web page, or slide presentation.

- Adobe Dreamweaver
- Amaya
- Microsoft Frontpage
- Microsoft Expression Web
- NetObjects Fusion

Text Editors

- Sublime Text
- Notepad ++
- Vim
- Atom
- Emacs

4.5 Helper applications: CGI, PERL, JAVA SCRIPTS, PHP, ASP, .NET Applications

CGI, PERL

What is CGI?

- The Common Gateway Interface, or CGI, is a set of standards that define how information is exchanged between the web server and a custom script.

The Common Gateway Interface, or CGI, is a standard for external gateway programs to interface with information servers such as HTTP servers.

- The current version is CGI/1.1 and CGI/1.2 is under progress.

Web Browsing

To understand the concept of CGI, lets see what happens when we click a hyper link to browse a particular web page or URL.

- Your browser contacts the HTTP web server and demand for the URL ie. Filename.
- Web Server will parse the URL and will look for the filename in if it finds that file then sends back to the browser otherwise sends an error message indicating that you have requested a wrong file.
- Web browser takes response from web server and displays either the received file or error message.

What is PERL?

- Perl is a stable, cross platform programming language.
- Perl stands for **Practical Extraction and Report Language**.
- It is used for mission critical projects in the public and private sectors.
- Perl is an *Open Source* software, licensed under its *Artistic License*, or the *GNU General Public License (GPL)*.
- Perl was created by Larry Wall.
- Perl 1.0 was released to usenet's alt.comp.sources in 1987
- Latest version of Perl is 5.16.2
- Perl is listed in the *Oxford English Dictionary*.

PC Magazine named Perl a finalist for its 1998 Technical Excellence Award in the Development Tool category.

PERL Features

- Perl takes the best features from other languages, such as C, awk, sed, sh, and BASIC, among others.
- Perl database integration interface DBI supports third-party databases including Oracle, Sybase, Postgres, MySQL and others.
- Perl works with HTML, XML, and other mark-up languages.
- Perl supports Unicode.
- Perl supports both procedural and object-oriented programming.
- Perl is extensible. There are over 500 third party modules available from the Comprehensive Perl Archive Network (CPAN).
- The Perl interpreter can be embedded into other systems.

JAVA SCRIPTS

[Self Study]

PHP

PHP started out as a small open source project that evolved as more and more people found out how useful it was. ***Rasmus Lerdorf*** unleashed the first version of PHP way back in 1994.

- PHP stands for 'PHP: Hypertext Preprocessor'.
- PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire e-commerce sites.
- It is integrated with a number of popular databases, including MySQL, PostgreSQL, Oracle etc.
- PHP is pleasingly zippy in its execution, especially when compiled as an Apache module on the Unix side. The MySQL server, once started, executes even very complex queries with huge result sets in record-setting time.
- PHP is forgiving: PHP language tries to be as forgiving as possible.
- PHP Syntax is C-Like.
- PHP is an open source software (OSS), This means it's free to use and isn't being controlled by a single entity.
- PHP is free to download and use
- PHP files may contain text, HTML tags and scripts.
- PHP files are returned to the browser as plain HTML.
- PHP files have a file extension of ".php", ".php3", or ".phtml".

- PHP can be written in any text editor.
- PHP script will be located inside special tags, much like JavaScript
  e.g. <?php //php script here ?>
- PHP code can be located any where in the page.
- PHP is case sensitive.
- Every variable in PHP will have the $ symbol as a prefix
  e.g. $myCollege =“KCC”;
- Every line of code MUST be terminated with a semicolon ‘;’.

Common uses of PHP:

- PHP performs system functions, i.e. from files on a system it can create, open, read, write, and close them.
- PHP can handle forms, i.e. gather data from files, save data to a file, thru email you can send data, return data to the user.
- You add, delete, and modify elements within your database thru PHP.
- Access cookies variables and set cookies.
- Using PHP, you can restrict users to access some pages of your website.

```
<!DOCTYPE html>
<html>
<body>

<h1>My first PHP page</h1>

<?php

      echo "Hello World!";

?>

</body>
</html>
```

ASP

Microsoft® Active Server Pages (ASP) is a server-side scripting environment that you can use to create and run dynamic, interactive Web server applications. With ASP, you can combine HTML pages, script commands, and COM components to create

interactive Web pages and powerful Web-based applications that are easy to develop and modify.

- ASP stands for **A**ctive **S**erver **P**ages
- ASP is a Microsoft Technology
- ASP is a program that runs inside **IIS**
- IIS stands for **I**nternet **I**nformation **S**ervices
- IIS comes as a free component with **Windows 2000 and newer.**

What is an ASP File?

- An ASP file is just the same as an HTML file
- An ASP file can contain text, HTML, XML, and scripts
- Scripts in an ASP file are executed on the server
- An ASP file has the file extension ".asp"

How Does ASP Differ from HTML?

- When a browser requests an HTML file, the server returns the file
- When a browser requests an ASP file, IIS passes the request to the ASP engine. The ASP engine reads the ASP file, line by line, and executes the scripts in the file. Finally, the ASP file is returned to the browser as plain HTML

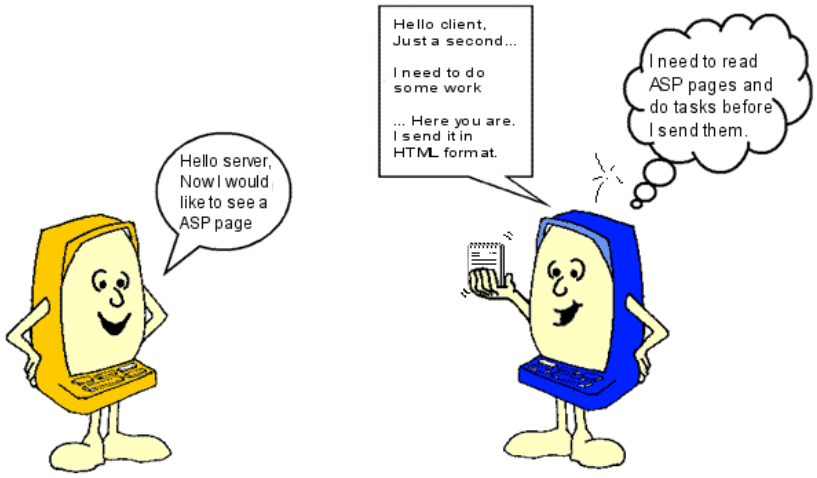
What can ASP do?

- Dynamically edit, change, or add any content of a Web page
- Respond to user queries or data submitted from HTML forms
- Access any data or databases and return the results to a browser
- Customize a Web page to make it more useful for individual users
- The advantages of using ASP instead of CGI and Perl, are those of simplicity and speed
- Provide security - since ASP code cannot be viewed from the browser

```
<!DOCTYPE html>
<html>
<body>
<%

      response.write("Hello World!")
```

```
%>
</body>
</html>
```

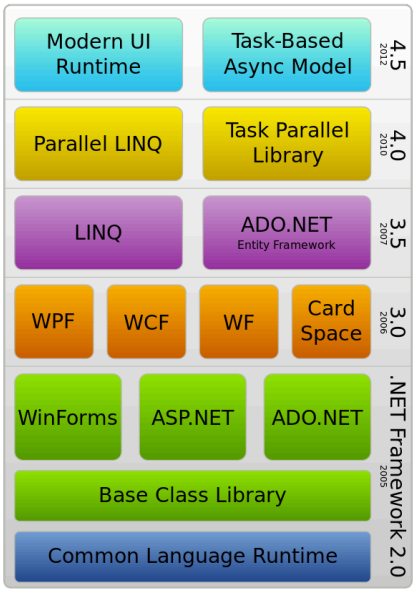


.NET is a Microsoft web services strategy to connect information, people, systems, and devices through software, making it easier for users to share and use their information between multiple websites, programs, and computers. In addition to being a web service, .NET is also a programming model that enables software developers the ability to do rapid application development by bundling a collection of software in on package. For example, Microsoft Visual Studio .NET is part of the .NET programming model.

The principal design features are:

- Interoperability: This allows for .NET-developed programs to access functionalities in programs developed outside .NET.
- Common Runtime Engine: Also known as the common language runtime, this allows programs developed in .NET to exhibit common behaviors in memory usage, exception handling and security.
- Language Independence: Common language infrastructure specifications (CLI) allow for the exchange of data types between two programs developed in different languages.
- Base Class Library: A library of code for most common functions--used by programmers to avoid repetitive rewriting of code.
- Ease of Deployment: There are tools to ensure the ease of installing programs without interfering with previously installed applications.

- Security: Programs developed in .NET are based on a common security model.



The .NET Framework Stack

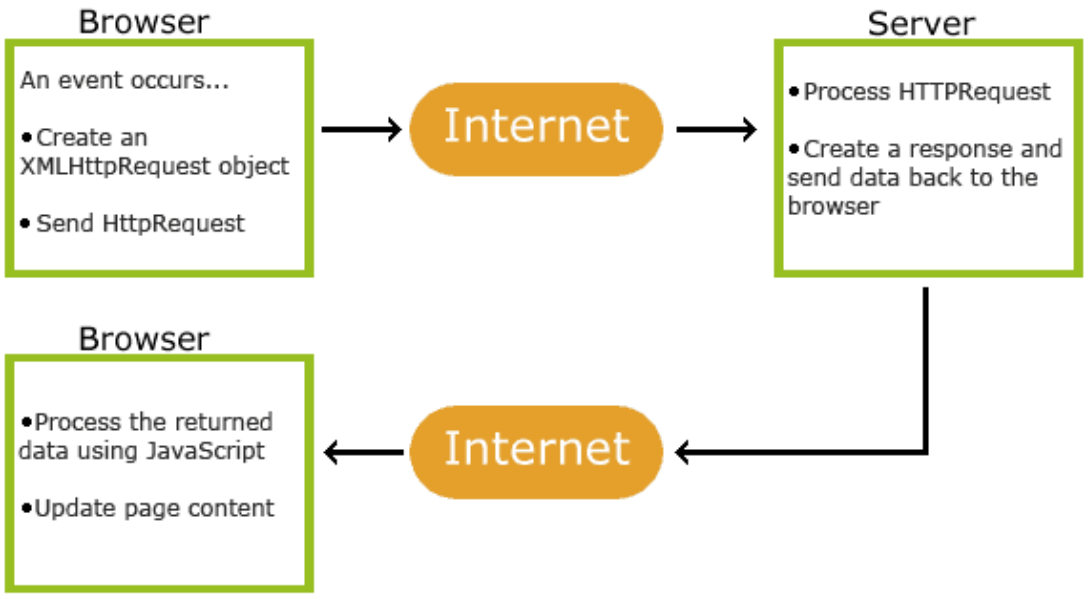
4.6 Introduction to AJAX (Programming)

AJAX = Asynchronous JavaScript and XML.

AJAX is not a new programming language, but a new way to use existing standards.

AJAX is the art of exchanging data with a server, and updating parts of a web page - without reloading the whole page.

How AJAX Works



AJAX is based on internet standards, and uses a combination of:

- XMLHttpRequest object (to exchange data asynchronously with a server)
- JavaScript/DOM (to display/interact with the information)
- CSS (to style the data)
- XML (often used as the format for transferring data)

AJAX Example Explained

The AJAX application above contains one div section and one button.

The div section will be used to display information returned from a server. The button calls a function named loadXMLDoc(), if it is clicked:

```
<!DOCTYPE html>
<html>
<body>

<div id="myDiv"><h2>Let AJAX change this text</h2></div>
<button type="button" onclick="loadXMLDoc()">Change Content</button>

</body>
</html>
```

Next, add a <script> tag to the page's head section. The script section contains the loadXMLDoc() function:

```
<head>
<script>
function loadXMLDoc()
{
.... AJAX script goes here ...
}
</script>
</head>
```

The XMLHttpRequest object is used to exchange data with a server.

Send a Request To a Server

To send a request to a server, we use the open() and send() methods of the XMLHttpRequest object:

```
xmlhttp.open("GET","ajax_info.txt",true);
xmlhttp.send();
```

4.7 Browser as a rendering engine: text, HTML, gif and jpeg

A **web browser engine** (sometimes **rendering engine**) is a software component that takes marked up content (such as HTML, XML, image files, etc.) and formatting information (such as CSS, XSL, etc.) and displays the formatted content on the screen. It draws onto the content area of a window, which is displayed on a monitor or a printer. A layout engine is typically embedded in web browsers, e-mail clients, e-book readers, on-line help systems or other applications that require the displaying (and editing) of web content. Engines may wait for all data to be received before rendering a page, or may begin rendering before all data is received.

WebKit, the rendering engine in Apple's Safari and Google's Chrome web browsers, which is now the most widely used browser engine. Current versions of Chrome (except iOS version) and Opera are based on Blink, a fork of WebKit.

Gecko, the Mozilla project's open-source web browser engine, is used by a variety of products derived from the Mozilla code base, including the Firefox web browser, the Thunderbird e-mail client.

Trident, the web browser engine from Internet Explorer, is used by many applications on the Microsoft Windows platform, such as netSmart, Outlook Express, some versions of Microsoft Outlook, and the mini-browsers in Winamp and RealPlayer.

Opera Software's proprietary Presto engine is licensed to a number of other software vendors, and was used in Opera's own web browser.

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