

ASP.NET

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1 Introduction

This paper is going to be dedicated to ASP.NET. The focus will be on ASP.NET and other technologies will short be described to see the similarity and difference between them.

In early days with HTML, web pages were static and needed to be modified manually now and then. This led to the development of a server-side technology, Microsoft's Active Server Pages (ASP) that would allow creating dynamic web pages. The server made it possible to generate dynamic web pages responding on the actions from the user [7].

ASP.NET is the newest form of ASP, and soon the ASP will be completely replaced by ASP.NET. ASP and ASP.NET is created by Microsoft and is a technique, which we have mentioned, to create dynamic web pages. In a dynamic web page the content of the page is often stored in a database. The user can then search trough the database from an interface on the web page to get some sort of information. The ASP.NET technology is more stable and runs faster than the older ASP, which opens new possibilities for web development [4].

An example of how a web page can be dynamic using ASP.NET. Imagine you have a user called "Smith". You could write a dynamic ASP.NET page, which will greet the user according to the current time. In the morning, let's say from 6:00 AM to 11:00 AM you could greet Mr. Smith with: "Good Morning Mr. Smith. How are you?" and from 12:00 PM to 18:00 PM with something like: "Good Afternoon Mr. Smith", etc [6].

2 Description

In this section we will describe the ASP.NET technology. We will present some history and describe how it works. We will also compare ASP.NET with PHP and JSP, these technologies are technologies in the same area as ASP.NET.

2.1 The history of ASP and ASP.NET

The original ASP has gone trough versions from 1.0 to 3.0 with default language VBScript. We will never see a version 4.0, because ASP.NET is the next generation of ASP. ASP.NET is not an upgrade of ASP. Instead it is part of the .NET Framework, and Microsoft has spent three years on rewriting ASP.NET from the ground [11].

ASP has gone through five major releases:

- ASP 1.0 in December 1996
- ASP 2.0 in September 1997

- ASP 3.0 in November 2000
- ASP.NET 1.0 (part of the Microsoft .NET Framework) in January 2002
- ASP.NET 2.0 in November 2005

When ASP.NET was realeast it was called ASP+ or ASP PLUS. But then Microsoft decided to name it ASP.NET, because it is a part of the .NET Framework [13].

2.2 How does it work?

To understand how ASP.Net works we will first present how the "old" (non dynamic) web works. In the old web we have a web server and a client (i.e. Web browser). The client is asking the server for a web page, the server reads the requested file page and sends it back to the client. A bit more schematic view of this is shown in figure 1 [6].

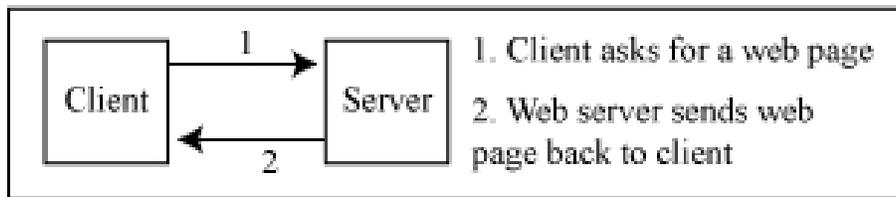


Fig. 1. This figure describe how the "old" web works. (Adapted from [6])

In ASP.NET (dynamic) it works like this. The client asks the web server for a web page, the server sends the "question" to the ASP.NET engine, the engine then creates a new dynamic page and sends it back to the client. The page can look different for different users. A bit more schematic view of this is shown in figure 2 [6].

An ASP.NET page has the extension ".aspx". The older technique, ASP, has the extension ".asp". If a client asks for an ASP.NET page, the ASP.NET engine on the server processes the executable code in the page, before the result is sent back to the client [12].

ASP.NET makes it easier for people how have worked with development of Windows applications to develop dynamic web pages. This because ASP.NET uses similar controls, such as buttons and labels. These controls can then be assigned with different events, and when an event has occurred a certain bit of code can be executed. The controls then produce segment of HTML and JavaScript, which is a part of the resulting page that the server sends back to the client [14].

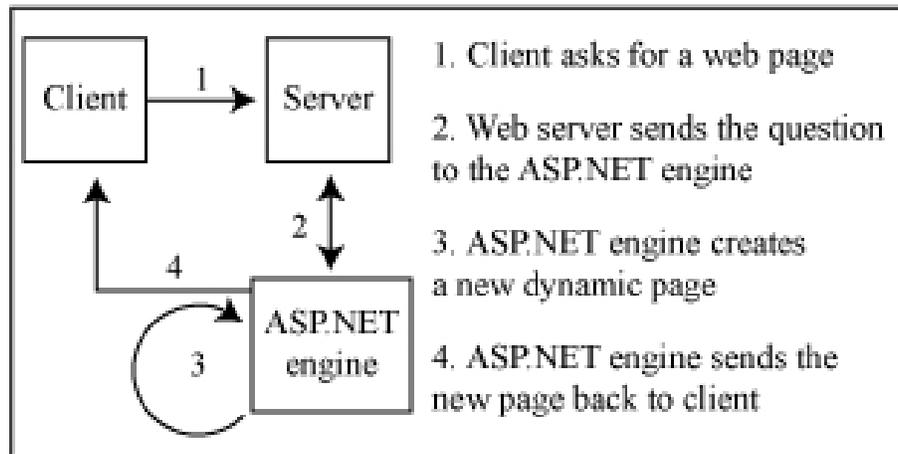


Fig. 2. This figure describe how the "new" web works. (Adapted from [6])

In ASP.NET, similar to desktop applications, you can use variables, define functions, create and use different classes and objects, and use a database to store something in [6].

Microsoft has completely rebuilt ASP.NET, based on the Common Language Runtime (CLR) shared by all Microsoft .NET applications. Programmers can write ASP.NET code using any of the different programming languages supported by the .NET Framework, usually Visual Basic.NET, JScript.NET, or C#, but also including open-source languages such as Perl and Python. ASP.NET has performance benefits over other script-based technologies because the server-side code is compiled to one or a few DLL files on a web server [14].

Microsoft Windows 2000 Professional and Server, Microsoft Windows XP Professional and Microsoft Windows Server 2003 all support ASP.NET. IIS needs to be installed to run ASP.NET and .NET Framework needs to get ASP.NET runtime [7].

The source code that is generated in Visual Basic translates into machine-specific code like assembly code and then to machine code via a compiler. Lower-level languages like assembly code and machine code are very platform specific. Programs for Windows are compiled to machine code directly and use Win32 libraries, a library that contains a lot of Windows-specific functions. The functions communicate with Windows that knows how to communicate with lower-level hardware. This is how the compiler turns a high-level instruction down to lower-levels. Two important parts in .NET are the Common Language Runtime (CLR) and the .NET Framework classes [8].

The .NET compiler translates the source code into a special intermediate language, Microsoft Intermediate Language (MSIL). The Common Language Runtime (CLR) then converts it into machine-specific instructions. The step between (CLR) and Running program happens when a program is executed. A bit more schematic view of this is shown in figure 3 [8].

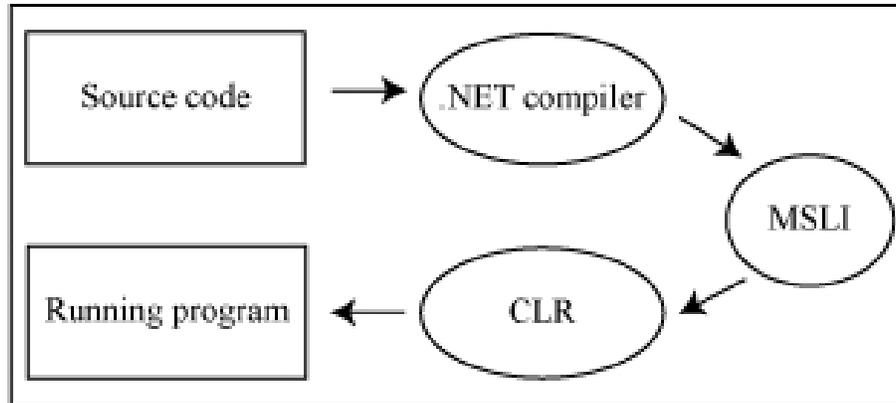


Fig. 3. This figure describe how the compiler works. (Adapted from [8])

The .Net applications use the .NET Framework classes. It is an organized collection of classes that contains all that a developer could need. The classes are organized in a hierarchical system of namespaces [8].

2.3 Other technologies

This section compares ASP.NET with PHP and JSP. Which are the similarities and differences?

PHP PHP stands for "PHP: Hypertext Preprocessor". The initials actually come from the earliest version of the program, which was called "Personal Home Page Tools" [17].

PHP is an open source program language that is suited for creating dynamic web applications. PHP can be used to interact with different databases such as MySQL, Oracle, Microsoft SQL Server and so on. PHP could run on operating systems like Unix, Linux, Windows and Mac OS X [17].

PHP 5 released in 2004 has object-oriented functionality which earlier version prior version 3 did not have. Some weaknesses in older versions of PHP are the lack of event-based error handling. If some interruptions occur in the normal flow

of the code there is nothing standardised that solves the exception. This leads to programmers that need to solve errors on their own. Other weaknesses are that PHP is case insensitive. The benefits with PHP are the open source code, which helps in finding bugs and getting them fixed. PHP has also a smaller code path, which results in faster execution. Choosing between PHP and ASP.NET is a matter of taste and depends of the knowledge in the area [5].

JSP JSP stand for "JavaServer Pages" and is a Java technology to create dynamic web pages. The JSP code is compiled into something that is called Java Servlets by a JSP Compiler [16].

It is much easier to reuse code and interface layout in ASP.NET than there is in JSP. The code or the interface layout you want to use can easily be dragged and dropped. There is also a performance difference between ASP.NET and JSP. An ASP.NET page can partial be cached and the way that pages are compiled in ASP.NET and JSP gives ASP.NET an advantage [9].

The major difference between them is that JSP calls a Java program that is executed by the Web server, while ASP.NET contains a script that is interpreted by a script interpreter before the page is sent to the user [9].

Jsp has the advantages of being used by the mass including beginners and has a proven track record. It is clear that ASP.NET is beginning to find favour with people who really matter, professional developer [9].

3 State of the art examples

This section presents some state of the art examples. The one we will present are ginza.se, sweden.se and connex.se. All these homepages uses ASP.NET.

3.1 ginza.se

Ginza is a webshop where CDs, DVDs and other music related products could be bought. The webshop demonstrates how an ASP.NET site could be made. Ginza is one of Sweden's most popular webshops regarding buying music on the web [3].

Figure 4 shows a screenshot of their swedish homepage.

Here is a link to their homepage: <http://www.ginza.se/>



Fig. 4. This is a screenshot of ginza homepage [3]

3.2 sweden.se

The homepage sweden.se is a homepage that presents Sweden. On the homepage you will find very much information about Sweden. The homepage is produced by: the Swedish Institute, the Invest in Sweden Agency, the Swedish Government Offices, the Swedish Trade Council and VisitSweden [10].

Figure 5 shows a screenshot of their homepage.

Here is a link to their homepage: <http://www.sweden.se/>



Fig. 5. This is a screenshot of sweden homepage [10]

3.3 connex.se

Connex is a worldwide company, located in 20 countries. Their business concept is to offer safe and reliable trip. One example of this is that they operate, on mission from SL (stockholm local traffic), the subway and some bus routs in stockholm [2].

Figure 6 shows a screenshot of their swedish homepage.

Here is a link to their homepage: <http://www.connex.se/>

The screenshot shows the Connex Sweden homepage. At the top, there is a navigation bar with the Connex logo on the left, a search bar in the middle, and a language selector on the right set to 'Svenska'. Below the navigation bar, the page is divided into several sections. On the left, there is a section for 'Normlandståget' (Norland train) with a link to the English version. In the center, there is a section for 'Nyheter' (News) featuring an article about the Stockholm subway. On the right, there is a section for 'Hitta på hemsidan' (Find on the homepage) with a search bar and radio buttons for 'Störningssida', 'Tjänstebiler', and 'Kontakta oss'. Below the search bar, there is a section for 'Sök på webbplatsen' (Search on the website) with a search box and 'Sök' button. At the bottom, there is a section for 'Andra textstörrelser' (Other text sizes) with 'Normal', 'ANMÅ', and 'STÖRRE' buttons. A map of Sweden is displayed in the center, with a legend for 'Stockholm', 'Norland', and 'Sverige'. The footer contains contact information for Connex Sverige AB, including the address, phone number, fax, and email.

Fig. 6. This is a screenshot of connex homepage [2]

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A Relate to course literature

This section will reflect the ASP.NET technique through some related ones.

A.1 WWW (World Wide Web, W3)

The World Wide Web was first developed to place where a bunch of people could share knowledge, and collaborate with others in projects over a distance [1].

"The web was designed so that if it was used independently for two projects, and later relationships were found between the projects, then no major or centralized changes would have to be made, but the information could smoothly reshape to represent the new state of knowledge. This property of scaling has allowed the web to expand rapidly from its origins across the Internet irrespective of boundaries of nations or disciplines." [1]

Today the World Wide Web is a huge global space of information. People can both read from it and write to it if they are using the right tools. The only restriction is that the tool being used has an Internet connection, and that the person using it has permission to view/change the content. The term World Wide Web is often mistakenly associated with the Internet itself, but World Wide Web is actually a service that operates over the Internet [19].

A.2 HTTP (HyperText Transfer Protocol)

The HTTP (HyperText Transfer Protocol) is a protocol for transferring information; it also makes it possible to do hypertext jumps. HTTP is a protocol that requests and response and runs over a TCP connection. HTTP is used in requesting and receiving an ASP.NET page. It is possible to transfer more than just HTML documents. To do this the client sends information of what format it can handle to the server. The server then sends back data in that format [1].

HTTP is an URI (Uniform Resource Identifier) with string characters, which makes it possible to find the requested resources, other URI are "ftp", "mailto", "urn" etc [18].

A.3 W3 Client (Web browser)

"A W3 "client" program runs on your computer. When it starts, it displays an object, normally a document with text and possibly images." [1]

In the page that is displayed some are highlighted in different way (i.e. links) if these are clicked on with the mouse the client will retrieve another object or page from the same or a different server [1].

There exist many W3 client programs (i.e. web browsers). The web pages are sent in the same way to all web browsers, so it is up to the browser to interpret the HTML code and display the page to the user. Some of all the web browsers are: Microsoft Internet Explorer, Mozilla Firefox, Opera, Safari and Netscape [15].

A.4 WYSIWYG (What You See Is What You Get)

WYSIWYG (What You See Is What You Get) is a term for direct manipulation of i.e. words, objects etc. Direct manipulation can be done with many different programs like Microsoft's Visual Studio. There it's possible to drag different objects to a design view and organize it. The way it's put in the design view that is what you get. The display shows the current state of how the objects and the text are organized [1].

This helps the user view something that will look like an end result when it is under construction and the users do not need to remember layout commands. Before WYSIWYG users were forced to enter code tags to perform different actions to the text. The first WYSIWYG program Bravo was released in late 1970 and users could see a full page of text which then could be printed out on laser printer [20].