

**Active Server Pages 3.0
Versus Hypertext Preprocessor 4.0**

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Executive Summary

Two of the most popular web application solutions competing for domination in the web industry today are Hypertext Preprocessor (PHP) 4.0 and Active Server Pages (ASP) 3.0. Companies choose a specific web application solution based on a variety of reasons, including installation requirements, language architecture, development environment, performance, and online support.

Companies who currently run Microsoft web server software often turn to ASP as a scripting platform because it is a very simple upgrade. Likewise, companies who use a variant of the Unix platform with the Apache web server tend to install PHP. Although PHP has been installed on a variety of other server configurations ASP only supports the Microsoft line of server software. Programmers adept in Visual Basic (VB) prefer coding ASP with VB Script because they do not have a steep learning curve to overcome. Similarly, Perl, C++ and Java programmers lean towards PHP's similar scripting language for an efficient web application solution. Microsoft provides a wonderful suite of applications for ASP development compared to PHP, which offers little more than basic editors. In contrast, PHP excels in performance while ASP has a tendency to lag behind. It is difficult to surpass the efficiency and price of a system configuration like a Unix operating system, an Apache web server and a PHP module. The speed is unsurpassable and the cost is unbeatable; that is free. As a result of the competitive nature of web developers, many have setup comprehensive guru web sites to promote their favored web application technology. Whether publishing priceless articles or answering questions in support forums, the ASP and PHP communities have dedicated supporters who volunteer their time for the education of their peers. Although ASP has the support of one of the largest corporations in the world (i.e. Microsoft), it still falls short of the strengthening free software movement that is backing PHP.

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1.0 Introduction

In the past it was sufficient for small businesses to maintain a static web site that served as an online business card. However, the evolution of internal and external networks, have spawned the need for dynamic web site features such as adaptability, online shopping and accessibility.

Microsoft's response to the demand of dynamic web sites was the deployment of Active Server Pages (ASP) in 1996. "Microsoft Active Server Pages enable the transition of static Web sites into dynamic, data-driven applications." (4) Using an augmentation of its patented programming language Visual Basic (VB), programmers already adept in VB can integrate a few minor syntax modifications to develop web programs in VB Script. It is for this reason that VB Script is the most commonly used scripting language in ASP development.

Lurking in the shadows of this software giant is a community constantly gaining light, a community of free, open-source software. Rasmus Lerdorf developed Personal Home Page (PHP/FI) in 1995 as an extension of the Perl scripting language. This new language began to get popular but only when a core group of developers redesigned the language engine for the release of PHP 3.0 did it begin its conquest. In version 3.0, PHP inherited a new meaning of Hypertext Preprocessor. Since then, an organization named Zend has been founded for the official development of PHP. Zend describes PHP as "a simple and universal solution for easy-to-program dynamic Web pages." (6)

Although similar in many ways, PHP and ASP also differ significantly in installation requirements, language architecture, development environment, performance, and support. These variants will be explored in the following report.

2.0 Installation Requirements

Installation of ASP and PHP are relatively easy. However, meeting the requirements (Fig. 1) for installation within a fixed budget is often the largest challenge.

	PHP 4.0	ASP 3.0
Operating System Platform	Several versions of Unix, Windows 9x/ME/NT/2000, MacOS, OS/2, Solaris, etc.	Windows 9x/ME/NT/2000, other platforms requires third-party ASP porting products
Supported Web Servers	Apache, IPlanet/Netscape Enterprise Server (NSAPI), Microsoft Internet Information Server (IIS), Zeus, fhttpd, etc.	Microsoft Internet Information Server (IIS), Personal Web Server (PWS), other servers but with third-party products only

Figure 1: System Requirements

Information obtained from Ebiz-Intellect.com (7).

PHP's cross-platform and multiple web server support is among one of its leading advantages over ASP. Microsoft only supports its line of operating systems (Windows 9x, Millennium Edition, NT, and 2000) and web servers (Internet Information Server (IIS) and Personal Web Server (PWS)) for deployment of ASP. This tightfisted support offers little options for companies not willing to purchase licensed copies of Microsoft's software. However, Sun Microsystems Inc., developed a product called Chili!Soft ASP which "provides run time Active Server Pages (ASP or .asp) support for a variety of Operating systems and Web servers." (8) Chili!Soft ASP has saved some companies money by allowing them to serve ASP using their current server setup. However, Chili!Soft ASP may also cost companies by increasing the demand of processing power and free memory from their servers and forcing expensive hardware upgrades.

The freely distributed Apache web server, which owns over sixty percent of the web server market share (Fig. 2), was a natural first choice for developers of PHP.

**Market Share - July 2001 (3294791 servers)
Across All Domains**

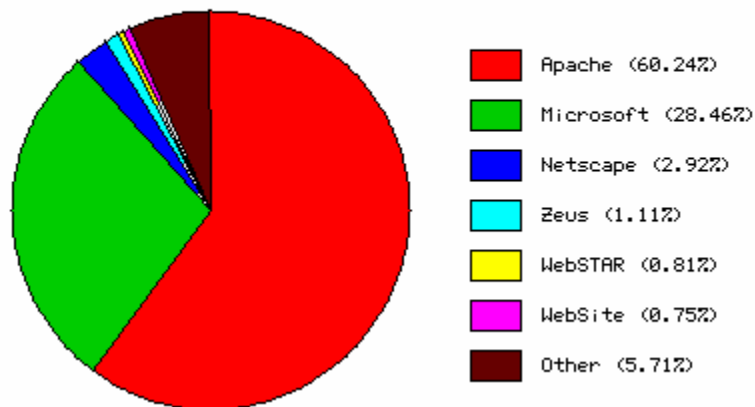


Figure 2: Web Server Market Share

Chart obtained from E-Soft Inc. (9)

Apache supports the most popular operating systems including all variants of Unix, Windows NT/2000, MacOS, OS/2, and Solaris. Thus, with the help of the Apache web server, PHP supports a considerable number of platforms. Although PHP 3.0 supported only the Apache web server, PHP 4.0 also supports several other web servers including those which hold the top three market shares; Apache, IIS and Netscape. With such a wide variety of support, third-party software is rarely needed when running PHP.

3.0 Language Architecture

Language architecture is very important to developers because it controls the difficulty of programming and debugging. Tidy syntax and an abundance of predefined functions can make the difference between a simple scripting task and a nightmare.

3.1 Language Syntax

ASP and PHP share the same intuitive interface in which code can be embedded within an HTML page. When the script parser encounters the “<%” tag for ASP or the “<?” characters for PHP, it knows that it must execute the following lines of code until it encounters the “%>” in ASP or the “?>” in PHP.

ASP supports several different programming languages such as JavaScript and Cobalt, but Microsoft’s VB Script is the most widespread ASP scripting language in use today. In fact, if no language is specified at the top of an ASP page, VB Script is assumed. To declare the use of another language parser the following tag must be declared on the first line of the page:

```
<%@ Language="JavaScript"%>
```

In order to swap between different scripting languages within an ASP page a tag similar to the following must encase the different language code:

```
<script language="JavaScript" runat="server">
</script>
```

VB Script is an altered version of the programming language Visual Basic. Compared to PHP’s inherited C and Java style scripting language, VB Script is a lot like the English language.

Example 1. ASP Conditional Syntax

```
<%  
if condition then  
    actions  
end if  
%>
```

Example 2. PHP Conditional Syntax

```
<?  
if (condition) {  
    actions  
}  
?>
```

Since VB Script is almost identical to the Visual Basic programming language, it is a natural step for VB programmers. Likewise, PHP's style of scripting allows effortless learning for programmers already adept in Perl, C, or Java. Programmers who are not familiar with a language similar to PHP or ASP are not faced with a steep learning curve. Study of either ASP or PHP as a first programming language is relatively simple.

3.2 Predefined Functions

An important asset of any programming language is an abundance of predefined functions or methods. These built-in tools can decrease coding time and simplify the debugging process.

Compared to PHP, VB Script's toolbox of predefined functions is quite miniature. With over a thousand functions, PHP has one of the largest predefined function library of any scripting language.

3.3 Component Object Model Support

ASP and PHP offer usability of Microsoft's Component Object Model (COM). COM is a model for binary code, which enables programmers to

instantiate objects for use in their scripts. ASP makes regular use of COM objects for database connections and email delivery. COM objects from other Windows applications may also be used in scripts, such as a Microsoft Excel Spreadsheet. Although PHP rarely needs to instantiate a COM object, it does have built-in COM functions for the Windows installation.

3.4 Object Oriented Programming Support

The ability to instantiate an object in any programming language is a powerful tool. Fourth-generation programming languages such as C++ and Java are among the few languages that support object oriented programming (OOP). Although VB Script and PHP are not programming languages but scripting languages, they do offer OOP. Custom classes coded in ASP and PHP are included in the pages that will make use of it and called from those pages accordingly.

VB Script's style of OOP is inherited from its integral language, Visual Basic. An object of a class named *VbsClass* is initialized like this:

Example 3: VB Script Class Object Initialization and Function Call

```
Dim objVbsClass
Dim strUserName
objVbsClass = new VbsClass
strUserName = objVbsClass.getUserName
```

PHP's OOP interface was derived from C and C++ and differs slightly from VB Script. Initialization of an object from a class named *PhpClass* looks like this:

Example 4: PHP Class Object Initialization and Function Call

```
$phpClass = new PhpClass;
$username = $phpClass->getUserName();
```

4.0 Development Environment

An effective integrated development environment (IDE) is essential for efficient development with any programming language. Microsoft's award winning Visual Studio 6.0 is one of the leading IDE suites available today. It comes bundled with an impressive set of tools, including the comprehensive Visual InterDev 6.0 editor, Visual Basic 6.0 and Visual SourceSafe 6.0. Because of its integrated support of Visual SourceSafe, database utilities and debugging, Visual InterDev is the preferred tool for most ASP developers. Visual InterDev also offers standard editor features like syntax highlighting, auto-completion of code, and project management.

At present, the PHP community does not have a favorite IDE. Among the most popular editors used for PHP development are Allaire's HomeSite, PHPed, and EditPlus. Although the PHP community has not yet adopted a common IDE, Zend has recently released version 1.1.0 of their maturing IDE. In addition to standard editor functionality such as syntax highlighting and project management, Zend IDE features a comprehensive debugger, the first of its kind for PHP. Important features that are currently unsupported by Zend IDE include integrated source-code control, file deployment and auto-completion of code. Although Zend IDE has received only moderate reviews, it has made "a competent first step toward providing a quality commercial integrated development environment for PHP." (1)

5.0 Performance

“ASP will probably never be as fast as PHP.” (5)

There are many variables that can impact the performance of a web application. The operation system, web server, and database play critical roles, as well as code efficiency and the web application parser itself. As shown in the benchmark table (Fig. 3), a PHP module installed on an Apache web server with a Linux operating system is the fastest web application configuration. Microsoft’s ASP follows close behind using IIS 4.0 on Windows NT 4.0 with Service Pack 4 installed and coding with VB Script.









Code Type	Hits/sec/MHz	Hits/s	CPU	OS	Web Server	Application
PHP	1.565 	626	PII-400	Linux 2.2.10	apache 1.3.7dv	mod_php 4-alpha
ModPerl Handler	1.236 	288	PII-233	Linux 2.2.7	apache 1.3.6	mod_perl
ASP VBScript	1.015 	540	PII-266 x 2	WinNT 4.0 SP4	iis 4.0	asp/vbscript
Embperl	0.781 	182	PII-233	Linux 2.2.7	apache 1.3.6	mod_perl/embperl
Java Servlet	0.335 	78	PII-233	Linux 2.2.7	apache 1.3.6	jrun 2.3
Perl CGI	0.327 	98	PII-300	Solaris 2.6	apache 1.3.4	mod_perl/registry
ASP PerlScript	0.250 	75	PII-300	Solaris 2.6	apache 1.3.4	mod_perl/asp
Mason	0.250 	75	PII-300	Solaris 2.6	apache 1.3.4	mod_perl/mason

Figure 3: Web Application Benchmarks

Information obtained from Perl Month (2).

ZDNet’s *eWeek* web publications also compared the performance of several scripting languages on identical computer systems and determined that PHP “had a speed of about 47 pages per second on a test Linux server.” (3) ASP again lagged behind on a Windows 2000 test server having “a speed of about 43 pages per second.” (3)

ASP and PH P have great database support. Both support all Open Database Connectivity (ODBC) compliant database systems like Microsoft Access, Microsoft SQL Server and Oracle. However, PHP has integrated MySQL database support with a variety of useful functions. MySQL is a free, open-source, and speedy database system. It has been designed for medium size web sites, larger web sites tend to depend upon high-end, expensive enterprise database systems like Oracle and Microsoft SQL Server. Although ASP also supports MySQL’s ODBC variant (MyODBC), it does not compare

with the efficiency and simplicity of PHP's set of built-in functions such as "mysql_connect()" and "mysql_query()". ASP's only comparable database support other than MyODBC is Microsoft Access, which lacks expandability and performance.

ASP also falls short in the memory management area. When including a file in ASP, IIS 4.0 will store a compiled copy of that file for each web page in which it is included. Only Windows 2000 and above can upgrade to IIS 5.0, which has an improved memory management system. Like PHP, IIS 5.0's new memory management system stores only one copy of each file include.

6.0 Online Support

Programming is rarely a challenge-less task. Consequently it is essential for a scripting language to have lots of resources and documentation. Both ASP and PHP have excellent online support and documentation.

PHP's official web site, *PHP.net*, includes an online manual in eleven languages (also downloadable), a searchable function list, and a user forum. *PHPBuilder* is also a popular web site, which features an assortment of helpful PHP articles, an enormous support forum containing over a hundred thousand posts, a code library, programmer resume postings, and documentation. *Zend* is another important web site consisting of articles, support forums, documentation and more.

ASP also has an abundance of support. The *Microsoft Scripting Technologies* web site offers a great reference for VB Script as well as other scripting technologies in eight different languages. The site also offers the VB Script manual for download in Windows HTML Help format, which provides a searchable index for topics and functions. Microsoft also publishes many helpful articles in its MSDN Library. *4GuysFromRolla* is another ASP web site offering comprehensive articles, an application directory, code snips, and more. *ASP101* is also a web site worth mentioning that includes great articles, code samples, and a support forum.

7.0 Conclusions

Microsoft's Active Server Pages 3.0 and Zend's Hypertext Preprocessor 4.0 are each great web application solutions for all scales of business. ASP presents a simple solution for companies who are currently running IIS under Windows NT/2000. Since ASP comes bundled with these operating systems it allows companies to simply run the IIS installer and begin serving ASP. However, since the majority of companies are currently running the Apache web server, it is an easy step to install the PHP module and begin serving PHP. PHP's cross-platform support also enables companies who are currently running IIS under Windows NT/2000 to serve PHP with the Win32 install.

Companies must also look at their team. Are they more familiar with Visual Basic? Or are they most comfortable with C++ or Perl? Developers who have previously coded web sites in Perl have little learning to adopt PHP. Similarly, VB programmers need only study a few syntax modifications to begin ASP development.

A powerful development environment such as Microsoft's Visual Studio 6.0 is an attractive asset when choosing a web application solution. Visual Studio's enterprise level support of ASP development is a good reason for companies to choose ASP. PHP's lack of effective IDE software leaves PHP developers using editors and source-control software from a variety of vendors. However, the Zend IDE is a maturing tool that will likely grow to be a competitive IDE in the near future.

Although ASP has a superior IDE and great online support, PHP outweighs ASP in cross-platform support, web server support, database support, predefined functions, and overall performance. Still some companies choose ASP for two main reasons: they are already equipped with IIS servers and/or they feel the need for Microsoft's corporate support.

8.0 Recommendations

We recommend that...

- ...Windows 2000 Server with IIS 4.0 is used for optimal performance when serving ASP 3.0.
- ...Red Hat Linux 6.2 with Apache 1.3.3 is installed for optimal performance when serving PHP 4.0.
- ...a class is compiled as a COM object with all the most used functions throughout a web application to increase performance and coding efficiency.
- ...Microsoft's Visual Studio 6.0 is used for ASP development.
- ...EditPlus 2.1 and Microsoft Visual Source-Safe 6.0 or Concurrent Versions System (CVS) 1.1 is used for PHP development with Windows workstations.
- ...Zend IDE and Concurrent Versions System (CVS) 1.1 are used for PHP development with Linux workstations.
- ...Zend Cache 1.1 and Zend Optimizer 1.1 are installed for optimal PHP performance.
- ...PHP 4.0 is investigated further at the following web sites:
 - *PHPBuilder* – <http://www.phpbuilder.com>
 - *PHP.net* – <http://www.php.net>
 - *Zend.com* – <http://www.zend.com>
- ...ASP 3.0 is investigated further at the following web sites:
 - *Microsoft Scripting Technologies* – <http://msdn.microsoft.com/scripting/>
 - *4GuysFromRolla* – <http://www.4guysfromrolla.com>
 - *ASP101* – <http://www.asp101.com>

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