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Professor Petcaugh Web Applications-CIS431

***1.2 Independent Research of Web Technologies***

***Research, then compare and contrast the following web technologies: Apache vs IIS, Tomcat vs PHP, MySQL vs PostgreSQL. Post your analysis below prior to the end of the unit.***

**Apache vs Windows IIS**

Apache HTTP Server:

Apache HTTP server is an open source Web server application that was developed by Apache Software Foundation (“IIS vs Apache - Which Web Server.”, 2018). The server software is open source and is freely distributed. Thus, the users can edit the underlying code in order to improve or develop performance. This means that the users are the main contributors to the future and development of the program.

Apache is most commonly paired with Linux operating systems (open source), although it can be used with any operating system. When combined with MySQL and PHP database and scripting language make up a LAMP Web server solution (“IIS vs Apache - Which Web Server.”, 2018).

Main Advantages:

* Lower costs due to it being open source software, meaning that there are no software licensing fees.
* Due to being open source programming is flexible ad allows specifications and exploration.
* Since Apache is not Microsoft O.S. based the majority of malicious programs are not focused to take advantage of apache specific vulnerabilities.

Microsoft Internet Information Service:

Microsoft’s IIS is a popular web server software that consists of a series of services including File Transfer Protocol, Hypertext Transfer Protocol, and Simple Mail Transfer Protocol, and others that enable a Windows machine to manage Web sites. It also includes modules for security, caching, logging, compression and diagnostics.

IIS is for Windows systems only, which means that a Windows Server is needed and thus it increases running costs. It overall is reviewed to be more prone to malware attacks and is viewed as a less secure server option.

Main Advantages:

* Windows and IIS are supported by Microsoft and therefore has more consistent support network.
* IIS supports Microsoft’s .NET framework, and ASPX scripts. (“IIS vs Apache - Which Web Server.”, 2018)
* Media pack modules are available to enable audio and video content streaming.

Summary:

On the level of consideration of cost, the LAMP combination will work out cheaper due to the fact that there are no licensing costs. With security Apache is viewed to be the more secure option. Apache is also more versatile, while IIS is only for Windows. However, IIS supports ASPX.

**Tomcat vs PHP**

Tomcat

Apache Tomcat software is an open source implementation of the Java Servlet, JavaServer Pages, Java Expression Language and Java WebSocket technologies (Apache Tomcat, 2018). It provides a “pure” Java web server environment for Java code to run in and tools for configuration and management. Tomcat can also be configured directly by editing XML configuration files. Due to being open source tomcat is cross-platform software and can be used on various operating systems. Tomcat is lightweight and flexible. However, with it being lightweight and flexible means that it may not be adequate for enterprise or production needs. Therefore, most administrators who use Tomcat will implement some form of additional monitoring, development, and configuration management tactics (“Using Apache Tomcat in Production - Tools, Tips, and Tricks.”, 2017).

Summary:

Tomcat is open source which makes it versatile with different operating systems but has no dedicated support. It is better suited for smaller scale use. It used command line utilities that can be used to obtain information about a web application and a few basic graphs as part of its manager application. It is configured using a number of XML configuration files, which when using one or two is easy to work with but when clustered the environment can become unfeasible (“Using Apache Tomcat in Production - Tools, Tips, and Tricks.”, 2017). It is lacking in key enterprise features such as deployment to multiple servers, version provisioning and rollback (“Using Apache Tomcat in Production - Tools, Tips, and Tricks.”, 2017). However, Apache Tomcat is considered cost effective (“Using Apache Tomcat in Production - Tools, Tips, and Tricks.”, 2017).

PHP

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML (“What Is PHP?”,2018). What makes PHP unique is that the code is executed on the server, generating HTML which is then sent to the client. The users then cannot see what the underlying code was. PHP is welcoming to new programmers and is simple to understand.

Instead of lots of commands to output HTML (as seen in C or Perl), PHP pages contain HTML with embedded code that does "something" (“What Is PHP?”,2018). The PHP code is enclosed in special start and end processing instructions <?php and ?> that allow you to jump into and out of "PHP mode."(“What Is PHP?”,2018)

Summary:

PHP is a general-purpose scripting language that is new user friendly. PHP can be activated within an HTML file, so users cannot see the underlying code, thus making it unique.

**MySQL vs PostgreSQL**

MySQL

MySQL is a popular Open Source SQL database management system that is developed, distributed, and supported by Oracle Corporation (MySQL 5.7 Reference Manual, 2018). A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add, access, and process data stored in a computer database, you need a database management system such as MySQL Server (MySQL 5.7 Reference Manual, 2018). Since computers are very good at handling large amounts of data, database management systems play a central role in computing, as standalone utilities, or as parts of other applications (MySQL 5.7 Reference Manual, 2018). MySQL databases are relational and stores data in separate tables. The database has rules to ensure that your application never sees inconsistent, duplicate, orphan, out-of-date, or missing data (MySQL 5.7 Reference Manual, 2018).

The MySQL Database Software is a client/server system that consists of a multithreaded SQL server that supports different back ends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs) (MySQL 5.7 Reference Manual, 2018).

MySQL Server can run comfortably on a desktop or laptop, alongside your other applications, web servers, and so on, requiring little or no attention. If you dedicate an entire machine to MySQL, you can adjust the settings to take advantage of all the memory, CPU power, and I/O capacity available. MySQL can also scale up to clusters of machines, networked together (MySQL 5.7 Reference Manual, 2018)

Summary:

MySQL is an open source SQL database that is well liked as a database management system. It strives and thrives off of specific documentation and implementation rules to allow your data to be consistent. It seemingly works well on a large scale.

PostgreSQL

PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads (The PostgreSQL Global Development Group, 2018). The origins of PostgreSQL date back to 1986 as part of the POSTGRES project at the University of California at Berkeley and has more than 30 years of active development on the core platform (The PostgreSQL Global Development Group, 2018). PostgreSQL is highly extensible, you can define your own data types, build out custom functions, even write code from different programming languages without recompiling your database (The PostgreSQL Global Development Group, 2018). PostgreSQL tries to conform with the SQL standard where such conformance does not contradict traditional features or could lead to poor architectural decisions. Many of the features required by the SQL standard are supported, though sometimes with slightly differing syntax or function (The PostgreSQL Global Development Group, 2018).

Summary:

PostgreSQL is an open source relational database system that extends the SQL language, and handles complicated data workloads. It may give more freedom to the clients due to the less strict documentation. This allowing for more specifics and architecture to be controlled and applied by the client.it also appears to work well with larger scale projects or implementations.

Work Cited

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