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Server Side Scripting

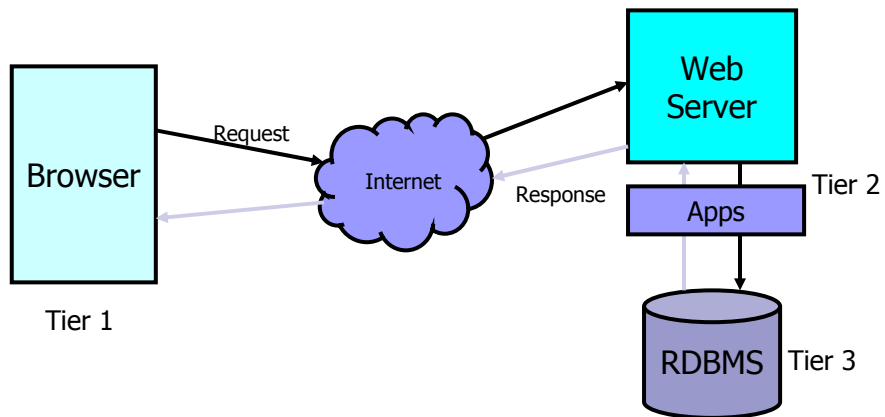


What is a server?

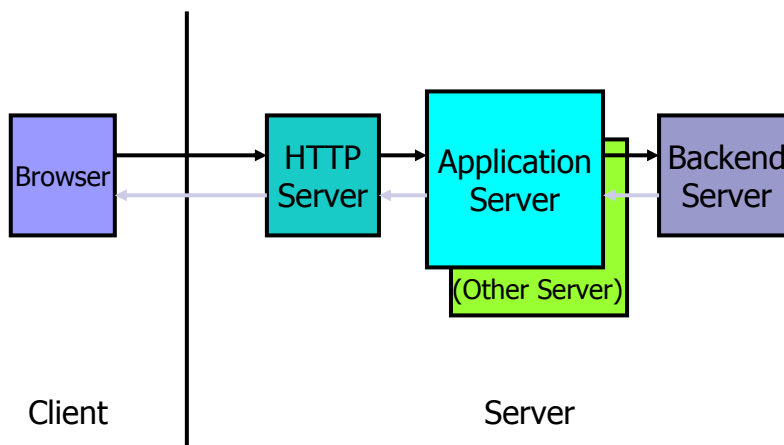
■ Many types of server

- File server file: networked file space
- FTP server ftp: remote file space, often read-only
- Web server http: web pages and more
- Mail server mail: email system
- News server news: newsgroups messages

Dynamic, Interactive Web Server (3-tier Architecture)



General Multi-tier Architecture





Web Content

- HTML documents are static

- Dynamic content
 - user-side programming
 - Middleware
 - ColdFusion, PHP etc.
 - server-side programming
 - scripting languages
 - programming languages



Server-Side Programming

- Database

- Searches

- Form processing

- Counters

- Mailing lists

- Customized pages etc.



Why Server-Side Programming?

- **Accessibility**
 - You can reach the Internet from any browser, any device, any time, anywhere
- **Manageability**
 - Does not require distribution of application code
 - Easy to change code
- **Security**
 - Source code is not exposed
 - Once user is authenticated, can only allow certain actions
- **Scalability**
 - Web-based 3-tier architecture can scale out



History of Dynamic Web Content

- **Common Gateway Interface (CGI)** was the first generation approach to providing dynamic web content
 - Used scripts
 - A process dispatched for each web page generated.
 - Hence inefficient and did not scale well.
- **Numerous second generation alternatives were invented:**
 - FastCGI
 - mod_perl
 - NSAPI
 - ISAPI
 - Java Servlets
- **These embedded HTML in programming code so that programmers had to develop them. Costly.**



Scripting - the Third Generation Approach

- Embed simple code in HTML pages
- The HTML pages use the code to decide what elements to display and what data should be displayed
- Classes and/or subroutines can be called to compute information for inclusion in the web page. Existing APIs can be invoked.
- This is known as 'scripting'



Scripting Language or Compiled?

- Scripting Languages:
 - Server Side Includes (SSI)
 - Perl
 - PHP
 - ASP (VBScript)
 - Python
- Compiled Languages:
 - C
 - C++
 - C#
 - ASP .Net
 - Java Servlets
 - Java Server Pages (JSP)
 - Looks like a scripting language, but is actually compiled into a Java Servlet
 - Either portable byte code (such as a Java .class file) or a true executable (native to the microprocessor) is produced
- Common to all scripting languages is some sort of real time interpreter that parses text and turns it into executable instructions for the server



Some Approaches to Scripting

- JavaServer Pages (JSP) by Sun Microsystems
- Hypertext Preprocessor (PHP) [open-source]
- ColdFusion (CFML) by Macromedia
- Active Server Pages (ASP and ASP.NET) by Microsoft



Criteria Affecting Decisions

- Web server availability
- Knowledge of language
- Scalability and efficiency
- Personal preference



What is JSP?

- JavaServer Pages
- Java-based technology that simplifies the development of dynamic websites
- Designed around the Java philosophy
- Packaged with J2EE
- As all XML-based technologies – it separates presentation aspects from programming logic contained in the code



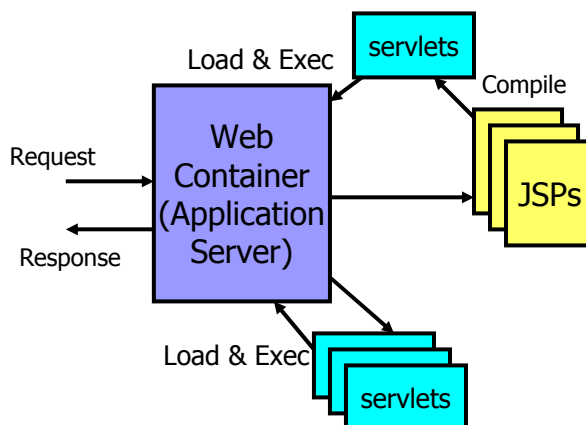
J2EE Technology

- Web container (Application Server)
- EJB container
- Servlets
- JSP (JavaServer Pages), Tag Library
- Applets, XML, JDBC, JNDI, JMS, RMI, IIOP, JavaMail, ...

Servlet Container/Engine

- Servlets/JSP require a Container
- Apache Tomcat is the reference implementation of the Servlet/JSP Specs
- It is open source, small, install quickly, and is FREE
- Web Site: jakarta.apache.org/tomcat
- It includes a simple HTTP 1.1 server, good enough for development and small intranets

Servlets and JSP





JSP Basics

- Individual JSP pages are text files stored on the web server
- When a page is first requested, the JSP engine uses the page to generate a Servlet
- The compiled Servlet is saved and used to service additional requests
- When a page is modified, the Servlet is regenerated
- Precompilation of pages is also feasible



A Simple JSP

```
<HTML>
<BODY>
Hello, visitor, It is now <%= new java.util.Date().toString() %>
</BODY>
</HTML>
```

- “new java.util.Date().toString()”
 - This creates a date object and converts it to a String that can be displayed.
- The <% %> element can be used to insert regular Java code to control the flow of a page



What is PHP?

- Open Source server-side scripting language designed specifically for the web
- Conceived in 1994, now used on +10 million web sites
- Supports a wide-range of databases (20 + ODBC).
 - Tightly integrated with MySQL
- Perl- and C-like syntax
- It is cross platform, unlike ASP which generally works only on Microsoft web servers (IIS)
- Website: <http://www.php.net/>



What is PHP?

- Designed similar to Active Server Pages
 - You embed PHP commands into your web pages
- Commands are preprocessed by the PHP processor and appropriate HTML is sent to the web server
- Lots of free or low cost software:
 - http://www.hotscripts.com/PHP/Scripts_and_Programs/ lists over 4000 programs
 - PHP Nuke is an excellent example: free portal software

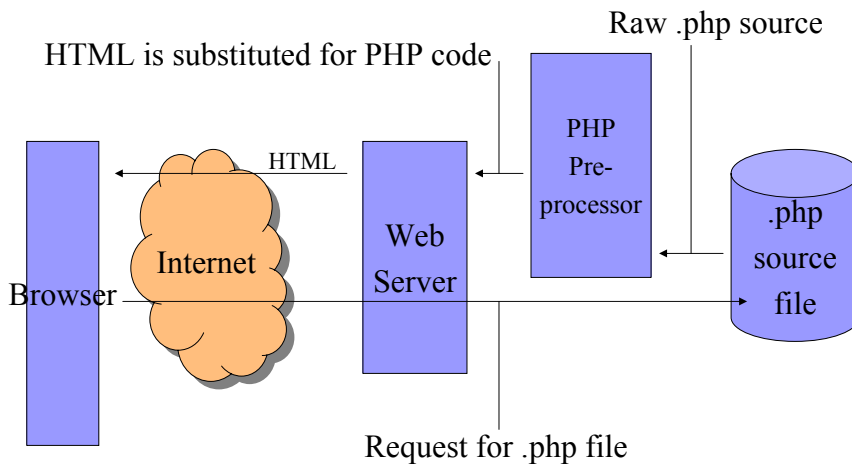


What is MySQL?

- Relational database management system (RDBMS)
- Free
- Can run on UNIX, Windows and Mac OS
- Website: <http://www.mysql.com/>



PHP Process Flow





PHP Example

- Begin and end script tags: `<?php ?>`
can also use `<? and ?>`
- PHP statements must be terminated with a semicolon (“;”)

```
<html>
<body>
<?php echo "Hello, World! I'm using PHP!"; ?>
</body>
</html>
```



PHP Form Data

- Access to the HTTP POST and GET data is simple in PHP
- The global variables `$_POST[]` and `$_GET[]` contain the request data

```
<?php
  if ($_POST["submit"])
    echo "<h2>You clicked Submit!</h2>";
  else if ($_POST["cancel"])
    echo "<h2>You clicked Cancel!</h2>";
?>
<form action="post.php" method="post">
  <input type="submit" name="submit" value="Submit">
  <input type="submit" name="cancel" value="Cancel">
</form>
```



ASP.NET

- Based on .NET framework and the Common Language Runtime (CLR)
- Compiled language
- New languages: Visual Basic .NET, C#, ...
- Improved component model
- Web Forms
- ADO.NET
- Web Services

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Server Side Scripting

ASP .NET vs. JSP vs. PHP



ASP .NET

- Microsoft only platforms
- Closed source
- Widely supported
- Not only limited to one language (C++, C#, VB, J#)
- One deployment choice -> "Wintel"



JSP

- Not widely supported by web hosting companies
- Not a JavaScript, includes all Java technology for use
- Real Java, not scripting language
- Many deployment choices



PHP

- Platform independent
- Origins in the C programming language
- Open source
- Many deployment choices
- Easy to learn
- Widely supported