Overview of Client-Side and Server-Side Interactivity

CGT356
Web Programming, Development, & Database Integration
Server-Side Technologies

- Client-Side
- Server-Side
Client-Side

• Def: Applications that run on a user’s machine and need a server to do some processing
• Typically refer to a user’s computer as the client
  o A student browsing the web is an example
• Any web browser, such as Chrome, is a client application that runs on a client machine
  o Chrome interprets HTML on the client machine, thus HTML is a client-side technology
Client-Side

- Prerequisite for this course dealt primarily with client-side technologies
- Other client-side technologies
  - HTML & HTML5
  - JavaScript & jQuery (anything JavaScript based)
  - VBScript
  - Jscript
  - Java
  - XML & XSL
  - ActiveX
  - Flash
  - Sound
  - There are more
Server-Side

- Def: Some **event** that occurs on the server of a client-server system.
- Servers typically reside in a dungeon deep below the earth’s surface with guys like Egor monitoring them.
  - Yes Master, Yes Master... I’ll install the ISAPI filter to enrich our web content so that it will be dynamically driven... Yes Master
  - But Egor has geek glasses, you know those thick black frames with tape in the middle... And he’s walkin around like Yes Master... Look for him on campus
Server-Side (cont.)

- Servers reside in a room and are usually not seen
  - Temperature regulated
  - Cables galore

- Usually do not ‘use’ a server once it is set up
Server-Side (cont.)

• Typically referred to as back-end technologies
  o Depends on the context
    • HTML could be the front end generated by an PHP back-end
    • PHP could be the front-end with a database backend
      o When you say this, you are typically talking about PHP generating the HTML front-end

• Other Server-Side Technologies
  o PHP
  o ASP.NET
  o JSP
  o CGI
  o ISAPI (Microsoft)
  o Databases
  o There are many, many, many more...
Server-Side (cont.)

- Languages that can be used on server-side technologies
  - Java
  - PHP
  - VB
  - VBScript
  - XML / XSL
  - JavaScript
  - C
  - C ++
  - SQL
  - C #
  - Perl
  - Many many more
Server-Side (cont.)

• This class will focus primarily on

  o PHP (the pages you create)

  o Databases (SQL) (the data you deliver to the browser)
    • MySQL (the specific database management system we use)

  o XML (a ubiquitous transfer language for Web and other means)
Server-Side (cont.)

CLIENT  SERVER

HTTP GET  HTTP RESPONSE

WEB BROWSER  MICROSOFT INTERNET INFORMATION SERVER

PROCESS SCRIPT  RETRIEVE PAGE

ActiveX CLIENT SCRIPT ENGINE  HTML PHP ASP ASPX JSP

PROCESS PAGE  IIS SERVER EXTENSIONS
Server-Side (cont.)

CLIENT

WEB BROWSER

SERVER
Server-Side (cont.)

CLIENT

WEB BROWSER

SERVER

HTTP GET

MICROSOFT INTERNET INFORMATION SERVER
Server-Side (cont.)

CLIENT

HTTP GET

WEB BROWSER

SERVER

MICROSOFT
INTERNET
INFORMATION
SERVER

RETRIEVE
PAGE

HTML
PHP
ASP
ASPX
JSP
Server-Side (cont.)

CLIENT

WEB BROWSER

HTTP GET

SERVER

MICROSOFT INTERNET INFORMATION SERVER

RETRIEVE PAGE

HTML
PHP
ASP
ASPX
JSP

PROCESS PAGE

IIS SERVER EXTENSIONS
Server-Side (cont.)

CLIENT

WEB BROWSER

HTTP GET

MICROSOFT INTERNET INFORMATION SERVER

HTTP RESPONSE

SERVER

RETRIEVE PAGE

PROCESS PAGE

HTML
PHP
ASP
ASPX
JSP

IIS SERVER EXTENSIONS
Server-Side (cont.)

CLIENT

WEB BROWSER

PROCESS SCRIPT

ActiveX CLIENT SCRIPT ENGINE

SERVER

HTTP GET

HTTP RESPONSE

MICROSOFT INTERNET INFORMATION SERVER

RETRIEVE PAGE

HTML

PHP

ASP

ASPX

JSP

PROCESS PAGE

IIS SERVER EXTENSIONS
Server-Side (cont.)

CLIENT

WEB BROWSER

PROCESS SCRIPT

ActiveX CLIENT SCRIPT ENGINE

SERVER

MICROSOFT INTERNET INFORMATION SERVER

RETRIEVE PAGE

HTML PHP ASP ASPX JSP

PROCESS PAGE

IIS SERVER EXTENSIONS

HTTP GET

HTTP RESPONSE
Prerequisites

• In the prerequisite course, we dealt with some JavaScript

• Client-Side
  
  `<script type="text/javascript">`
Prerequisites (cont.)

Processing takes place AFTER the page is sent to the client.
In contrast, on the Server-Side

Using the same JavaScript Example

```html
<script type="text/javascript" runat="server">

Then the resulting HTML is sent to the Client

CGT 356
Copyright © 2002-Present  Ronald J. Glotzbach
A Closer Look at the Server-Side

- Dynamic Linked Libraries
  A better way

- Inherently slow because CGI apps run outside of IIS

A chunk of code that executes when a request is made

- HTTP, FTP, Gopher

Determine the type of API

CGI APPLICATION
ISAPI

- Internet Server Application Program Interface

- Enables programmers to build Web applications that run much faster than conventional CGI applications because they are more tightly integrated with the Web server.
API

- Application Program Interface

- A set of stored routines, protocols, and tools for building software applications. (The building blocks for software development)
CGI Disadvantages

• If your web server is Windows:
  o CGI applications are a separate process from IIS
  o A new CGI application process is started each time a request is made for its service
  o Data cannot be shared between requests
  o Because of this, CGI is slow
Advantages of PHP

• Data can be persisted and shared between requests
• It has a low learning curve and is easy to program
• Not constrained by client-side applications
• ODBC can link to any data source
  o ODBC: Open Database Connectivity
Disadvantages of PHP

• It is an interpreted language, which means there is no compilation of code

• Debugging can be trial and error, but web browsers are pretty good about displaying messages

• It uses a scripting language, and does not use an OO programming language (although it is possible to write object oriented scripts)