A

Seminar report

On

Common Gateway Interface (CGI)

Submitted in partial fulfillment of the requirement for the award of degree
of Bachelor of Technology in Computer Science

SUBMITTED TO: SUBMITTED BY:

www.studymafia.org   www.studymafia.org

Acknowledgement

I would like to thank respected Mr…….. and Mr. ……..for giving me such a wonderful opportunity to expand my knowledge for my own branch and giving me guidelines to present a seminar report. It helped me a lot to realize of what we study for.

Secondly, I would like to thank my parents who patiently helped me as i went through my work and helped to modify and eliminate some of the irrelevant or un-necessary stuffs.

Thirdly, I would like to thank my friends who helped me to make my work more organized and well-stacked till the end.

Next, I would thank Microsoft for developing such a wonderful tool like MS Word. It helped my work a lot to remain error-free.

Last but clearly not the least, I would thank The Almighty for giving me strength to complete my report on time.

Preface

I have made this report file on the topic **Common Gateway Interface (CGI);** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to …………..who assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

WHAT IS THE COMMON GATEWAY INTERFACE?:

The Common Gateway Interface (CGI) is a specification defined by the World Wide Web Consortium(W3C) , defining how a program interacts with a Hyper Text Transfer Protocol(HTTP) server. The Common Gateway Interface (CGI) provides the middleware between WWW servers and external databases and information sources. CGI applications perform specific information processing, retrieval, and formatting tasks on behalf of WWW servers.

Why is CGI used?

An interesting aspect of a CGI enable Web server is that computer program can be created and deployed that can aspect user input and create a Web page on fly. Unlike static Web page that display some preset information, these interactive web pages enable a client to send information to the Web server and get back a response that depends on the input.

A Web search engine is a good example of an interactive web page. The client enters one or more keywords, and the Web index returns a list of Web pages that satisfy the search criteria entered. The Web page returned by the Web index is also dynamic, because the content of that page depends on what the content types in as search words – it's not a predefined static document.

To create an interactive Web page, HTML elements are used to display a form that accepts a client's input and passes this to special co9mputer programs on the Web server. These computer programs process a client's input and return rrquested information, usually in the form of a web page constructed on the fly by the computer program. These programs are known as gateways because the typically act as a conduit between the Web server and an eternal source of information, such as a database.

Gateway programs exchange information with the Web server using a standard known as the common Gateway Interface. This is the reason CGI programming is used to describe the task of writhing computer programs that handle client requests for information.

The term gateway describes the relationship between the WWW server and external applications that handle data access and manipulation chores on its behalf. A gateway interface handles information requests in an orderly fashion, and then returns an appropriate response. For example, an HTML document generated on the fly which contains the results of query applied against an external database.

In other words, CGI allows a WWW server to provide information to WWW clients that would otherwise not be available to those clients. This could, for example, allow a WWW client to issue a query to an Oracle database and receive an appropriate response in the form of custom built Web document.

Some common uses of CGI include –

- Gathering user feedback about a product line through an HTML form.

- Querying an Oracle database and rendering the result as an HTML document.

CGI – HOW IT WORKS:

As shown in the above figure, a Web browser running on a client machine exchanges information with a Web server using the Hyper Text Transfer Protocol or HTTP. The Web server and the CGI program normally run on the same system, on which the web server resides. Depending on the type of request from the browser, the web

server either provides a document from its own document directory or executes a CGI program.
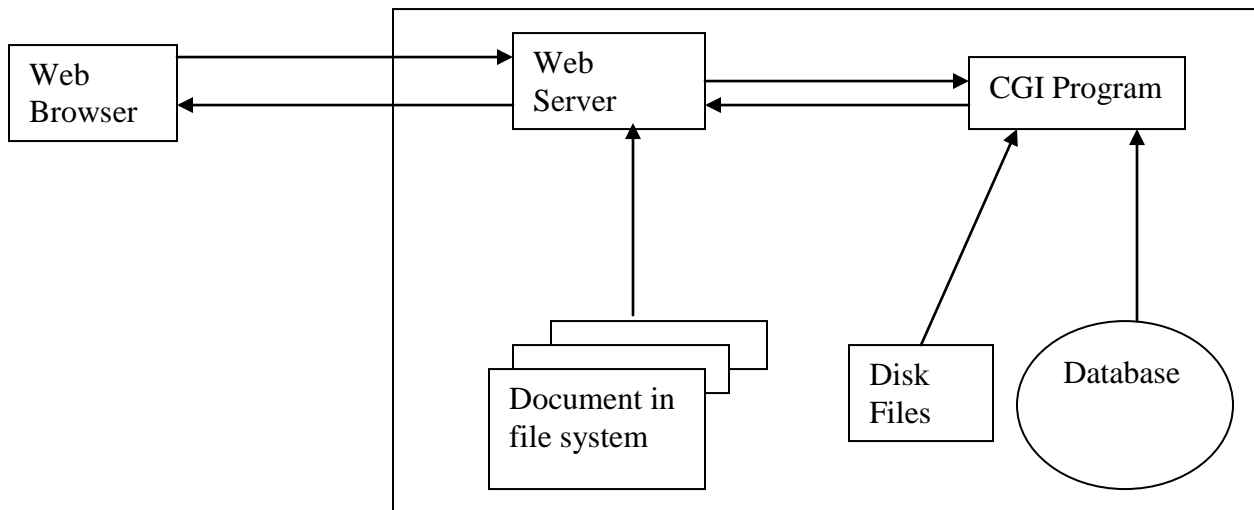
The sequence of events for creating a dynamic HTML document on the fly through CGI scripting is as follows:

- A client makes an HTTP request by means of a URL. This URL could be typed in to the 'location' window of a browser, be a hyperlink or be specified in 'action' attribute of an HTML <form> tag.

- From the URL , the web server determines that it should activate the gateway program listed in the URL and send any parameters passed via by the URL to that program.

- The gateway program processes the information and returns HTML text to web server. The server in turn adds a MIME header and returns the HTML text to the web browser.

- The web browser displays the document received from web server .

How Information Is Transferred From The Web Browser To A CGI Program:

The Web browser uses the *method* attribute of the < form> tag to determine how to send the forms data to the Web server. There are two submission methods :

GET: The Web browser submits the form data as a part of a URL.

POST: The Web browser sends the form's data separately from the URL as a stream of bits.

The GET Method:

The GET method is so called because the browser uses the HTTP GET command to submit the data. The GET command sends a URL to the web server.

The POST Method:

In the POST method of data submission , the web browser uses the POST command to submit the data to the server and includes the form's data in the body of that command .The POST command can handle any amount of data , because the browser sends the data as a separate stream. The POST method should be used to send potentially large amount of data to a web server.

How a CGI URL is interpreted by the Web Server:

The web server must be configured to recognized an HTTP request for a CGI program. IN short, configuring the web server involves informing it of the directory where the CGI programs reside. The URL specifying a CGI programs looks like any other URL, but the Web browser can examine the directory name and determine whether the URL is a normal document or a CGI program.

A URL can also include additional path information, which can be used by the CGI program. This path information needs to be included in the URL immediately following the CGI program name.

How a CGI Program returns Information to the Sever

Regardless of how the Web server passes information to the CGI program, the CGI program always returns information to the server by writing to the standard output. In other words, if a CGI program wants to return an HTML document, the program must write that document to standard output. The Web server then processes that output and sends the data back to the browser that had originally submitted the request. The CGI program adds appropriate header information to its output and sends this to the web server.

Processing Form Information in a CGI Program:

A CGI program needs to be able to access the form data and process it some way before generating any meaningful output. When a form submits data via the GET method, the CGI program receives information through the QUERY_STRING environment variable. If the form submits data via the POST method, the CGI program receives information through standard input.

The basic steps for a CGI program designed to handle URL – encoded data sent through both GET and POST methods are as follows:

- Check the REQUEST_METHOD environment variable to determine weather the request is GET or POST.

- If the method is GET, use the value of QUERY_STRING environment variable as the input. Also, check for any path information in the PATH_INFO environment variable.

- If the method is POST, get the length of the input (in number of bytes) from the CONTENT_LENGTH environment variable. Then read that many bytes from the standard input.

- Extract the name-value pairs for various fields by splitting the input data at the ampersand (&) character, which separates the values of fields.

- In each name-value pair convert all + signs to spaces.

- In each name-value pair, convert all %xx sequences to ASCII characters (xx, denotes a pair of hexadecimal digits).

- Save the name-value pairs denoting values of specific fields for later use.

What is CGI program?

A CGI program is a computer program that is started by the web server in response to an HTTP request.

A CGI program is generally used to process HTML form input from a web browser. The HTML<form> tag's *action* attribute specifies the name of the CGI program.

For example, the following <form> tag specifies a program named *query.cgi* in the */cgi-bin* directory on the web server *digital.com*

<FORM method=GET action=http://www.digital.com/cgi.bin/query.cgi>

PROGRAMMING LANGUAGES:

CGI programs have been developed in C,C++ ,Visual Basic and Perl.

Why Perl For CGI?:

A CGI program can be written in any of the above-mentioned languages, but Perl is specially suited for this because Perl programs are easy to learn and write. Perl has great text processing capabilities, which is why it was a natural choice for some of the first CGI sample programs .

Besides this Perl is a scripting language , which means it does not have to be compiled. Instead , an interpreter executes the Perl script, this makes it easy to write and

test Perl scripts, because they do not have to go through the typical edit-compile-link cycles.

THE PERL LANGUAGE:

Perl (Practical Extraction Report Language) was originally created to extract information from text files and use that information to prepare reports. Perl is a scripting language, which means the programmer does not have to compile and link a Perl script. Instead , an interpreter executes the Perl script. This allows the programmer to build larger and more complex programs in a short period of time. Unfortunately , some programmers do not give themselves enough time to get to know the language, which leads to inferior and inefficient code. The more complex the programs become, the more important it is to understand the syntax and semantics of the language.

PERL BASICS:

Like any computer program , a Perl program starts out as file containing commands or statements-in this case , they are Perl commands or statements.

- Perl is case sensitive.

- Perl is free form; there are no constraints on the placement of any keyboard. There are no rules for the exact number of spaces or lines.

- Each Perl statement must end with a semicolon(;).

- Commands begin with a hash mark(#).

- A group of Perl statements can be treated as a block by enclosing them in braces({…}).

PERL STRINGS:

Perl has three types of strings, namely – Double Quoted Strings,Single Quoted Strings and Back Quoted Strings. Each of these strings behaves differently from the other and provide special functionality to the Perl language.

Double Quoted Strings:

Double-quoted strings are commonly used because of the following features:

-        Scalar and array variables embedded in double-quoted strings are replaced by their values. Thus, Perl will treat the string "Total = $total" as "Total = 10" were $total is assumed to have a value 10.

-        In double-quoted strtings, charcters with a backlash prefix are replaced with a single special character. For example, \n becomes a new line and \t becomes a tab character.

Single Quoted Strings:

Perl displays a single quoted string without replacing variable names with their corresponding values. Single quoted strings also do not recognize escape sequences. Single quoted strings are simply treated as ordinary text.

Backquoted Strings:

Strings are enclosed in backquotes to display the output of some operating system command.

THE NEED FOR DATA STORAGE

In general, the goal of any commercial application program is the manipulation of relevant data. In order to achieve this, the programming environment shoukd be able to store that data for future use.

Variables

In Perl programs data is stored in variables. Each variable has a name and can store any type of data. Each variable name in a Perl program begins with a special character.

- a dollar ($) sign

- an at (@) sign or

- a percent (%) sign

the special character donetes the variable type. The three types of variables are as follows.

- Scalar Variables

- Indexed Array Variables

- Associative Array Variables

SCALAR VARIABLES

What is Scalar Variable?

Scalar Variables are the most basic form of data containers in Perl. A scalsr variable can reference a string value or a numeric value. Even though Perl treats strings and numbers with almost the same trgard, there is a definite visible difference between the two.

Reference

- **www.google.com**

- **www.wikipedia.org**

- **www.studymafia.org**