

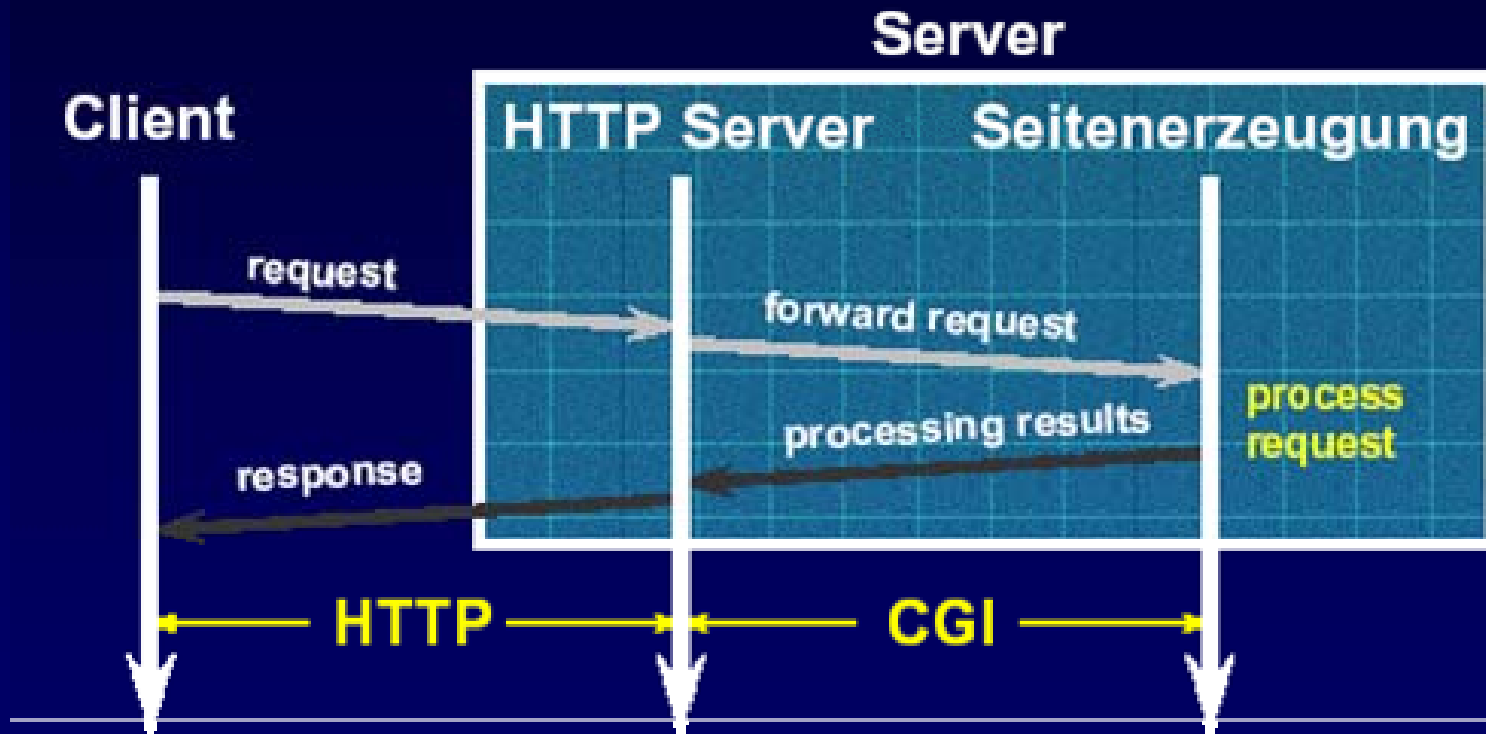
# PPS-Design of an own WWW-Homepage SS 2003

## Lecture 4: CGI Scripts and Forms

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# Common Gateway Interface (CGI)

- Common Gateway Interface
  - is a defined **interface** between information servers (eg., web servers) and external programs.



# CGI Scripts

- A **CGI Script** is a program which
  - runs on the remote Webserver
  - executes user requests
- A **CGI Script** is written in a programming language which is
  - **compiled** on the server where it's running (C, C++, Ada, etc.)
  - **interpreted** by an interpreter on the server where it's running (Perl, PHP, shell script, etc.)

# Communication Between the Web Server and the CGI Script

- 1. The Server receives a request -> it sets a number of **environment variables**
- 2. The Server **starts** the CGI script requested
- 3. The Server **writes data** (eg., parameters) to the script using its **standard input**
- 4. The CGI script produces a **result** and sends it back to the Server using its **standard output**

# To Run a CGI Script

- The exact configuration of running CGI scripts is **web-server dependant**
- The web-server **administrator** can **determinate**
  - whether CGI scripts **can be run at all**
  - where these scripts **should be located**
    - Eg., /home/httpd/cgi-bin/
  - which **extension** required (.cgi)
- The file containing the script should be **executable** (the 'exec' flags should be set)

# Assignment 1: 1<sup>st</sup> CGI

Create an HTML page using a CGI script which says: Hello World!

- Hints:
- Create a `.cgi` file with the CGI script.
  - Make this file executable.
  - Construct a dummy HTML page which contains a link to the CGI script.
  - Use on-line manuals:
    - o <http://www.perl.com/perl/>
    - o <http://user.it.uu.se/~matkin/documents/shell/>

# CGI Environment Variables

- Request **independent** variables
  - **SERVER\_SOFTWARE**: name and version of the WWW server
  - **SERVER\_NAME**: host name or IP address of the server
  - **GATEWAY\_INTERFACE**: version of CGI
- Request **dependant** variables
  - **SERVER\_PORT**: destination port number of the request
  - **REMOTE\_HOST** or **REMOTE\_ADDRESS**: identifier of the request sender machine
  - **Etc.**; <http://hoofoo.ncsa.uiuc.edu/cgi/env.html>

# Assignment 2: CGI, Example 2

```
#!/bin/sh
echo "Content-Type: text/html"
echo
echo "<!DOCTYPE HTML PUBLIC "-//IETF">"
echo "This is a simple CGI script"
echo "<br>"
id
echo "<br>"
date
echo "<br>" $SERVER_SOFTWARE
echo "<br>" $REMOTE_HOST
```

← Shell script

Result →

```
This is a simple CGI script
uid=9905(httpd) gid=901(employee)
Mon May 12 13:45:36 MET 2003
Apache/1.3.26 Ben-SSL/1.23 (Unix)
vpn-global-012-dhcp.ethz.ch
```



# Results of CGI Scripts

- Connect to the web-server using **standard output**
- All CGI results must start with a **header** containing the description of the result
- Possible results
  - **HTML page**
    - "Content-Type: text/html"
    - Defined MIME-Type of the answer
  - **Reference** to the result (URI or file path)
    - "Location: http://redirectedsite.com"
  - **Status report**
    - "Status 302"

# HTML Forms

- Using forms it's possible to submit data
- Elements
  - Container
    - `<FORM>`
  - Control
    - `<INPUT>`
    - `<BUTTON>`
    - `<SELECT>`
    - `<TEXTAREA>`
    - `<LABEL>`

# The <FORM> Element

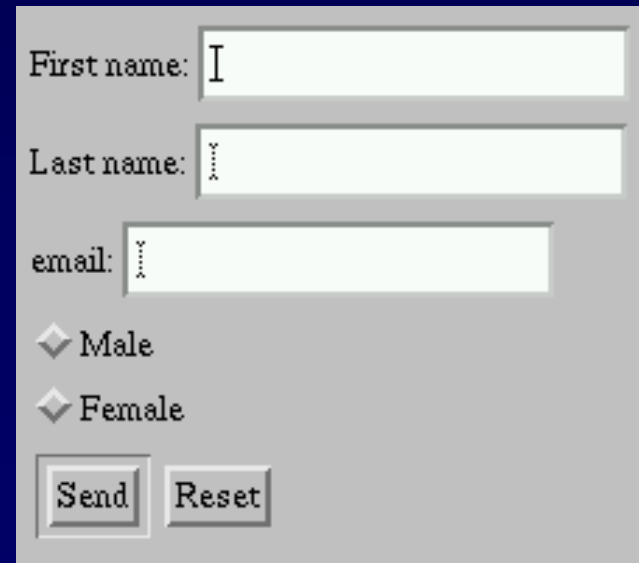
- Acts as a **container** for content
- Defines **what to do** with the form data specified by the *controls*
  - Where the data should be sent?
  - How it should be sent?
- Important **attributes**
  - ACTION
  - METHOD
  - ONSUBMIT
  - ONRESET
  - TARGET

# Control Elements

- **<INPUT>**
  - The **general control** element with several attributes
- **<BUTTON>**
  - To create **general buttons**
- **<SELECT>**
  - To create **pop-up menus**
- **<TEXTAREA>**
  - To create a **text input** control of **arbitrary size**
- **<LABEL>**
  - To **associate a label** with a form control
- More information
  - <http://www.w3.org/TR/REC-html40/interact/forms.html>

# Form Example

```
<FORM action="http://somesite.com/prog/adduser" method="post">  
<P>  
  First name: <INPUT type="text" name="firstname"><BR>  
  Last name: <INPUT type="text" name="lastname"><BR>  
  email: <INPUT type="text" name="email"><BR>  
  <INPUT type="radio" name="sex" value="Male"> Male<BR>  
  <INPUT type="radio" name="sex" value="Female"> Female<BR>  
  <INPUT type="submit" value="Send"> <INPUT type="reset">  
</P>  
</FORM>
```



First name:

Last name:

email:

Male

Female

# Assignment 3: Form

Create a Form on an HTML page requesting the following information:

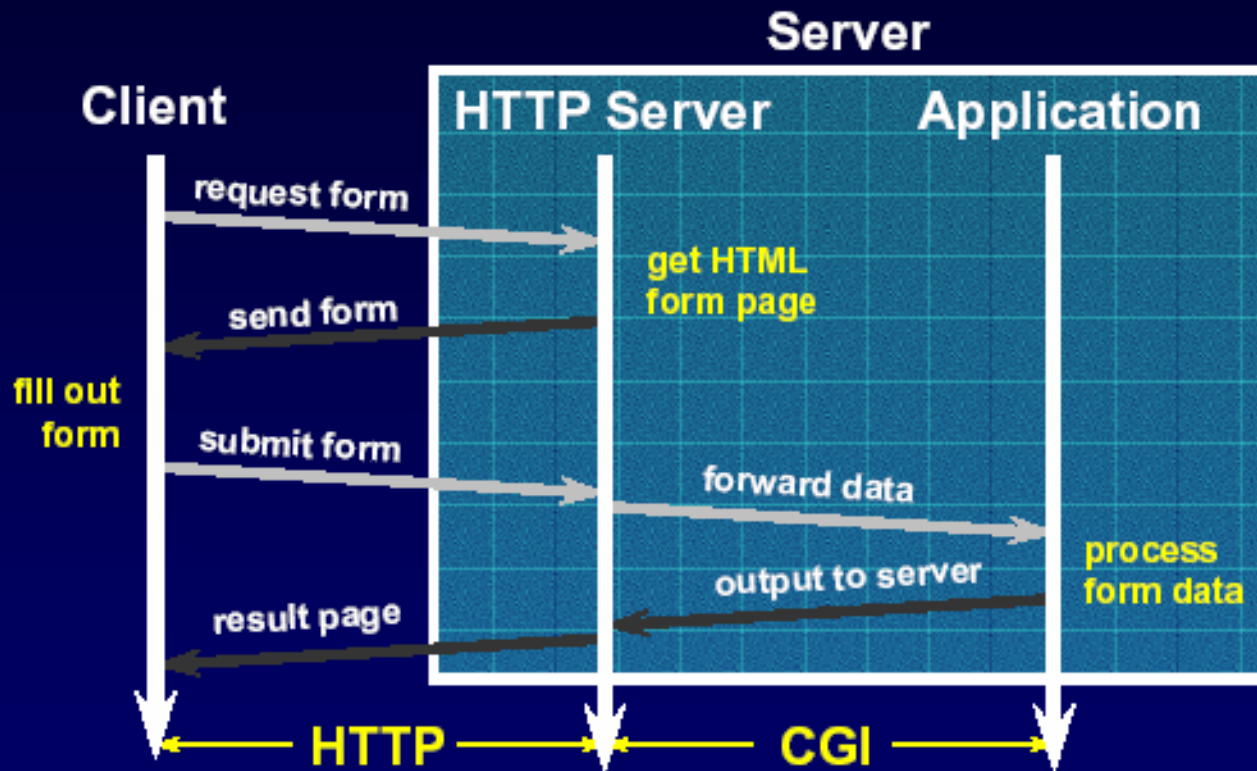
- Name;
- Date of birth (from a pop-up list);
- Favorite color (using radio buttons);
- Hobbies (using check-box list);
- Remarks (using text area).

Then e-mail this form to our own e-mail address.

**Hints:** - Use the previous example.

# CGI and Forms

- One of the most frequent applications of CGI is the **processing of form data**



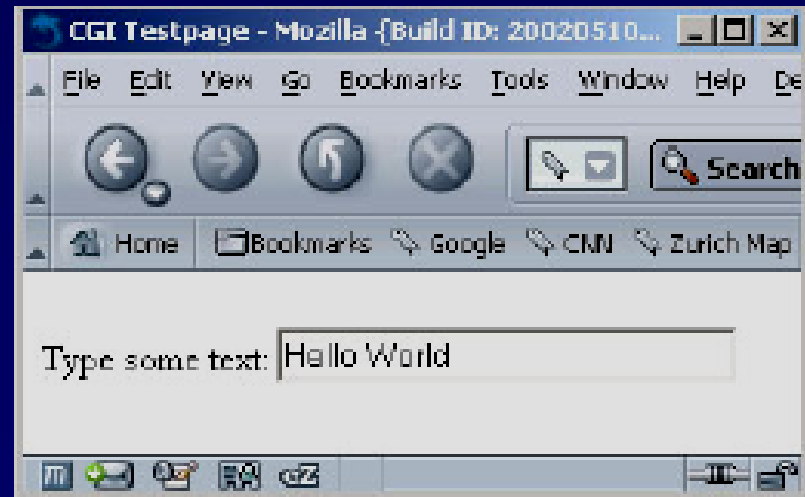
# CGI and Forms (cont'd)

- The `<FORM>` element `ACTION` attribute
  - is in this case a `URI to a CGI script`,
- and the `METHOD` attribute
  - is the `GET` or `POST` method.
  - `GET` method
    - The form data is `appended to the URI` using the '?' sign
    - Eg., `http://<host>/cgi/proba.cgi?foo=bar&test=hallo`
  - `POST` method
    - The form data is `included` in the body of the request
    - `More flexible and secure` solution than `GET`



# Form Example Using CGI

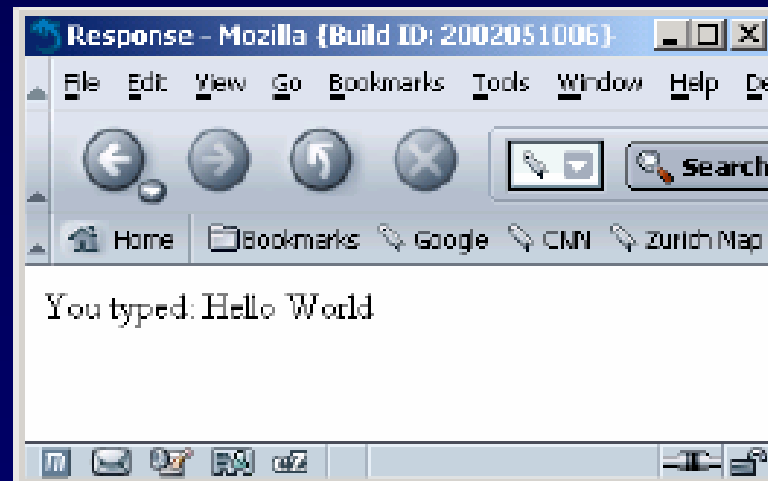
```
<html>  
<head> <title>CGI Testpage </title> </head>  
<body>  
<form action=http://test.cgi method="POST">  
  <p><b>Type some text:</b>  
  <input type="text" name="textinput" size="30"  
  maxlength="50"> </p>  
</form>  
</body>  
</html>
```



# Form Example Using CGI (cont'd)

```
#!/tiklopt1/bin/perl -w
use CGI qw(:standard);

my $value = param ('textinput');
print header(), start_html("Response"),
p("You typed: ", $value),
end_html();
```



# A Complex CGI Example: Visitors' Book

- You can download it:
  - <http://www.tik.ee.ethz.ch/tik/education/lectures/PPS/web/SS03/cgi/guestbook.zip>

# Further Information

- CGI Home Page
  - <http://www.w3.org/CGI/>
- A reference Home Page to Forms
  - <http://www.w3.org/TR/REC-html40/interact/forms.html>
- General Home Page to Web Design
  - <http://www.htmlhelp.com>