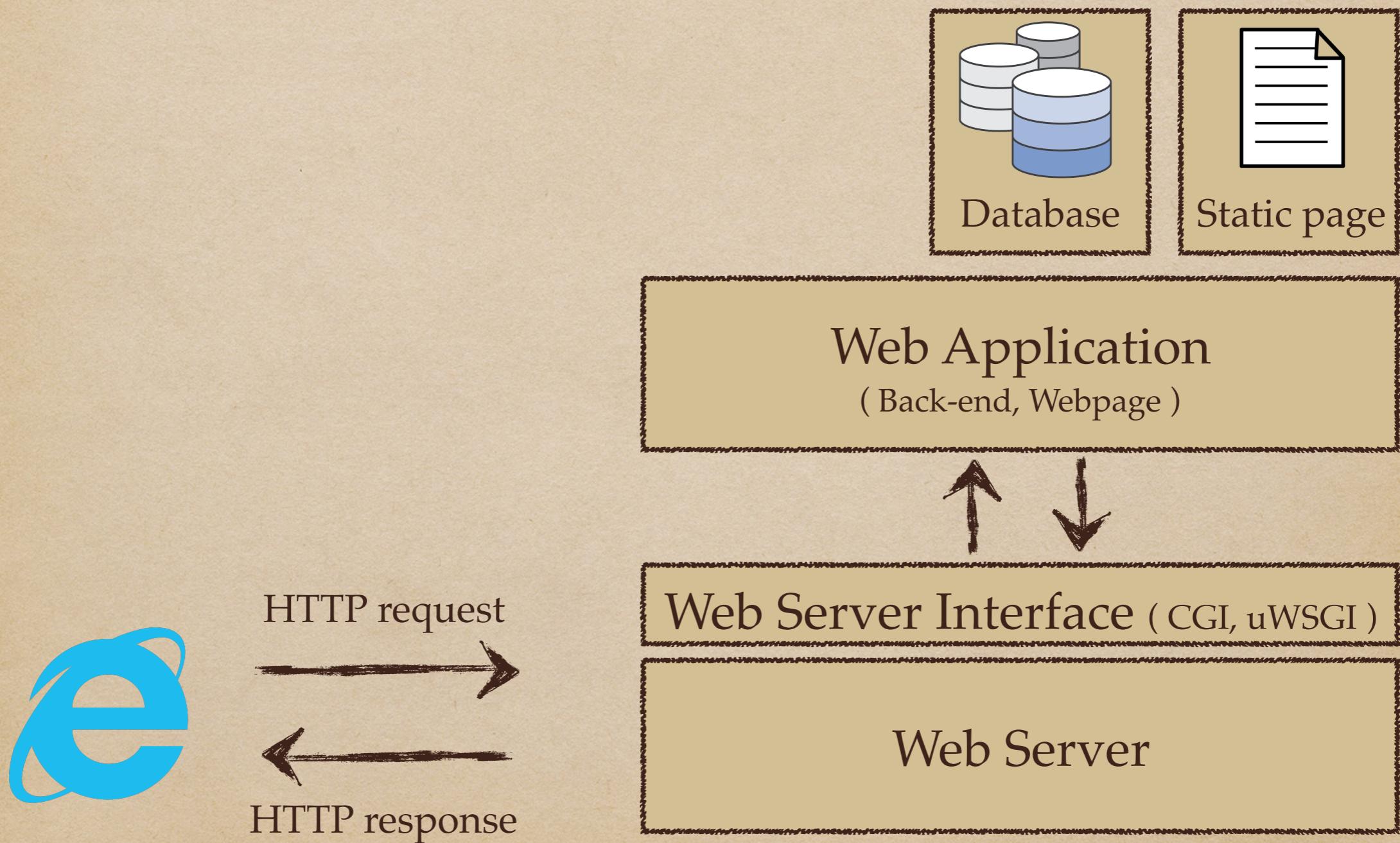


HW1

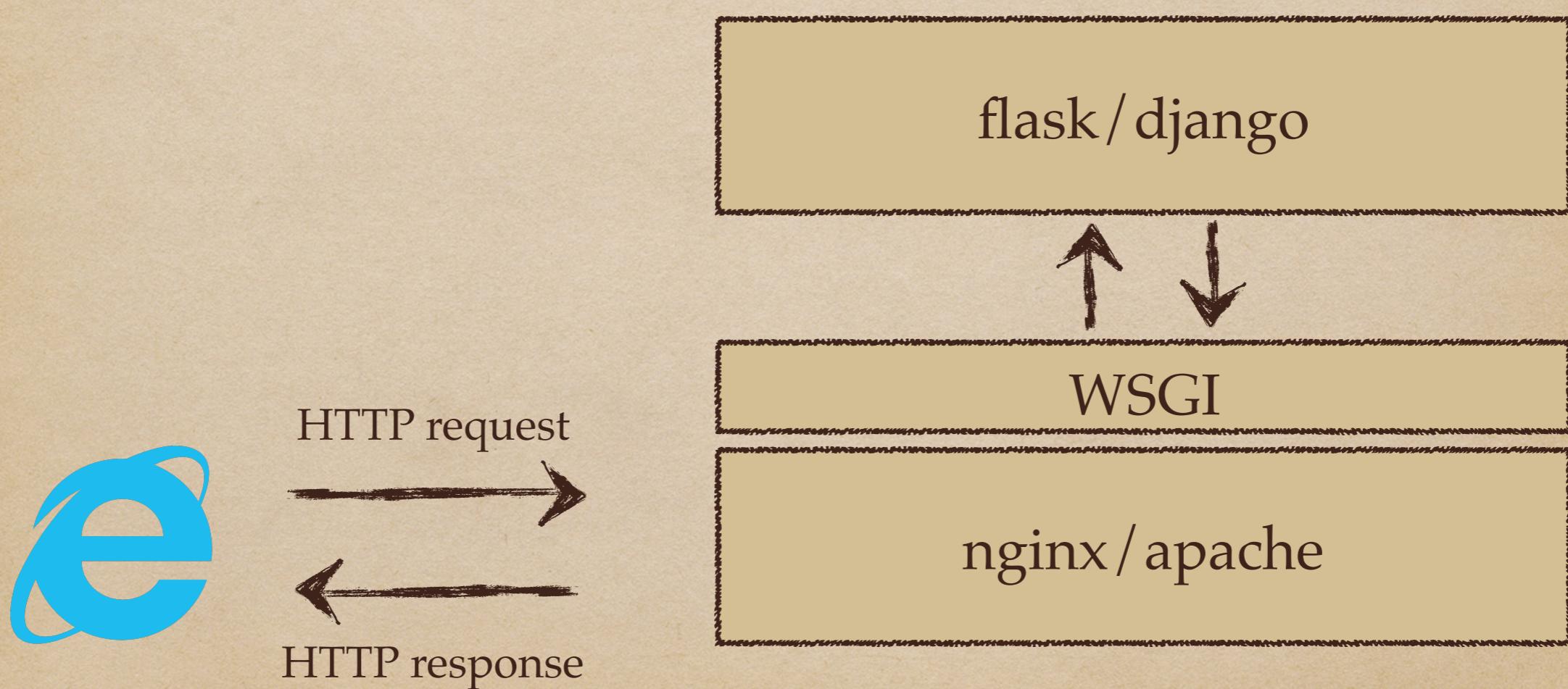
Network Security

HTTPD From Scratch

HTTP Workflow

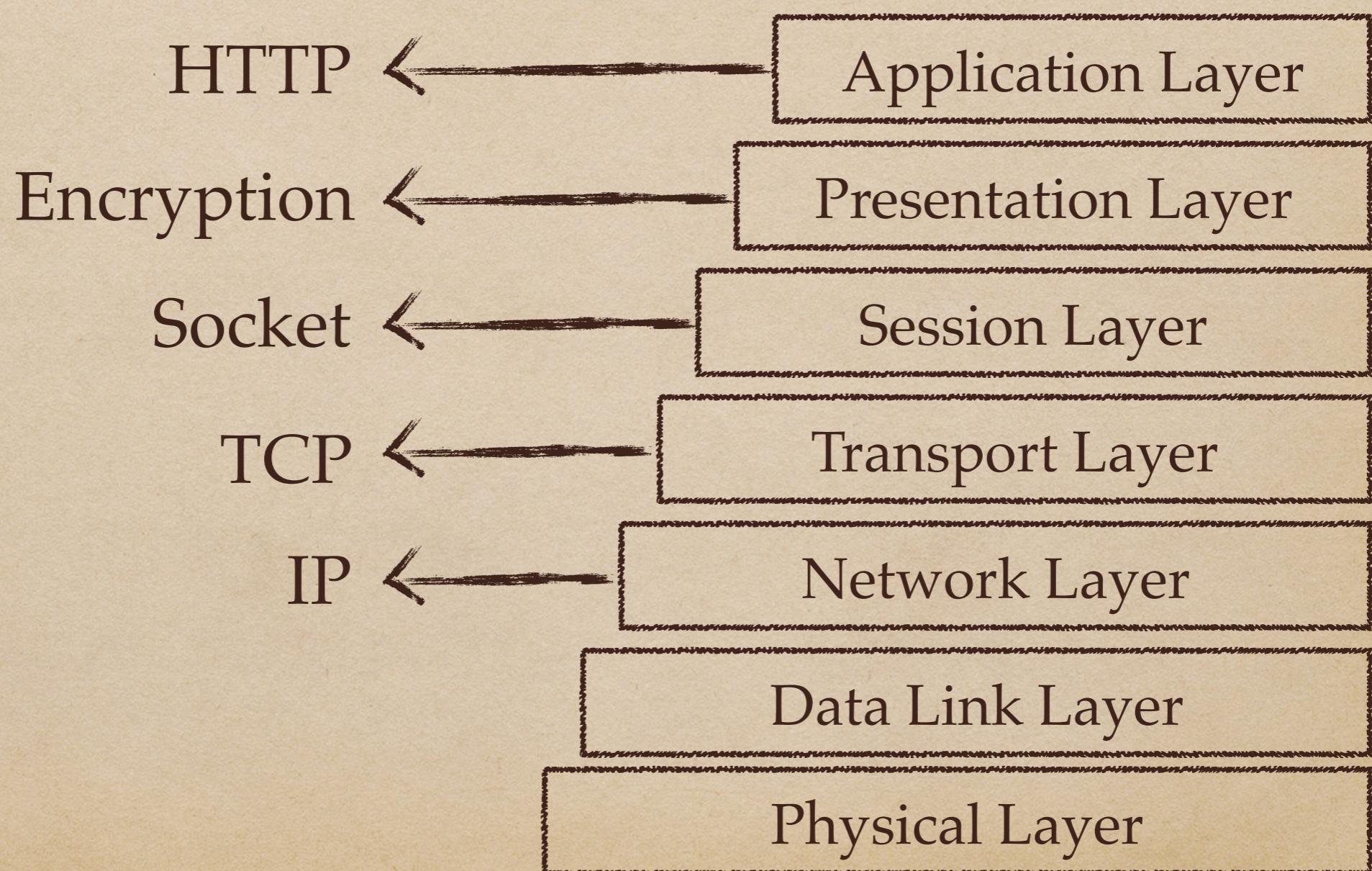


Python HTTP



HTTP

HyperText Transfer Protocol



Web Server

- Apache
 - <https://github.com/apache>
- Nginx
 - <https://github.com/nginx/nginx>
- Lighttpd
 - <https://github.com/lighttpd/lighttpd1.4>

HTTP Format

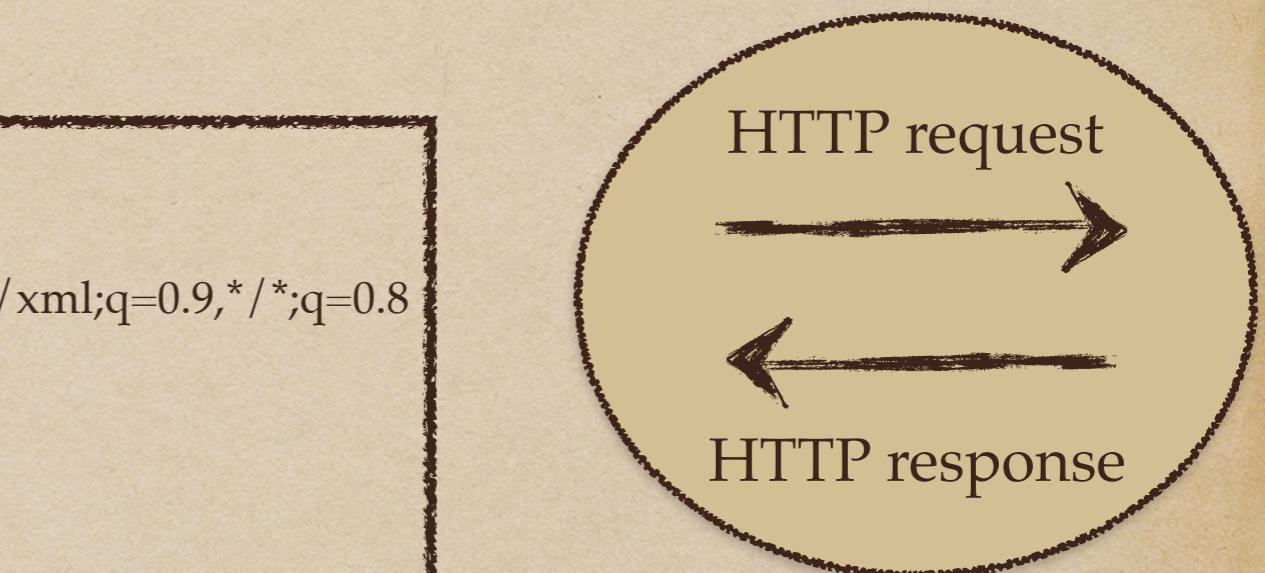
http request

```
GET / HTTP/1.1
User-Agent: Mozilla/5.0 ... ....
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: zh-tw
Connection: keep-alive
Accept-Encoding: gzip, deflate, br
Host: eof.ais3.org
```

http response

```
HTTP/1.1 503 Service Unavailable
Date: Tue, 17 Mar 2020 12:51:40 GMT
Content-Type: text/html; charset=iso-8859-1
Content-Length: 428
Connection: close
Server: Apache/2.4.41 (Unix) OpenSSL/1.1.1d
```

```
<html><head>
<title>503 Service Unavailable</title>
</head><body>
..... .....
```



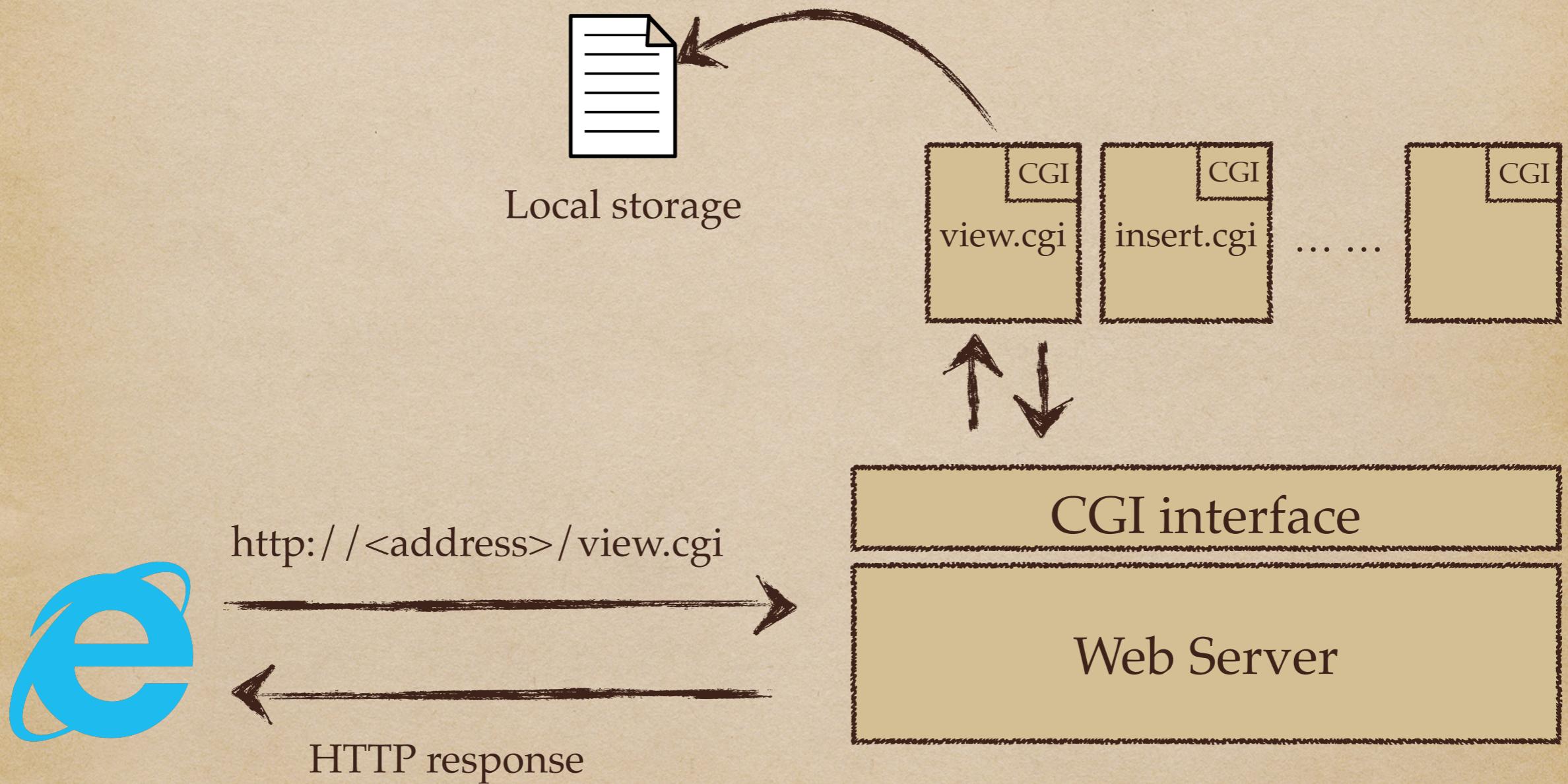
https://eof.ais3.org/index.html

Protocol Hostname Path

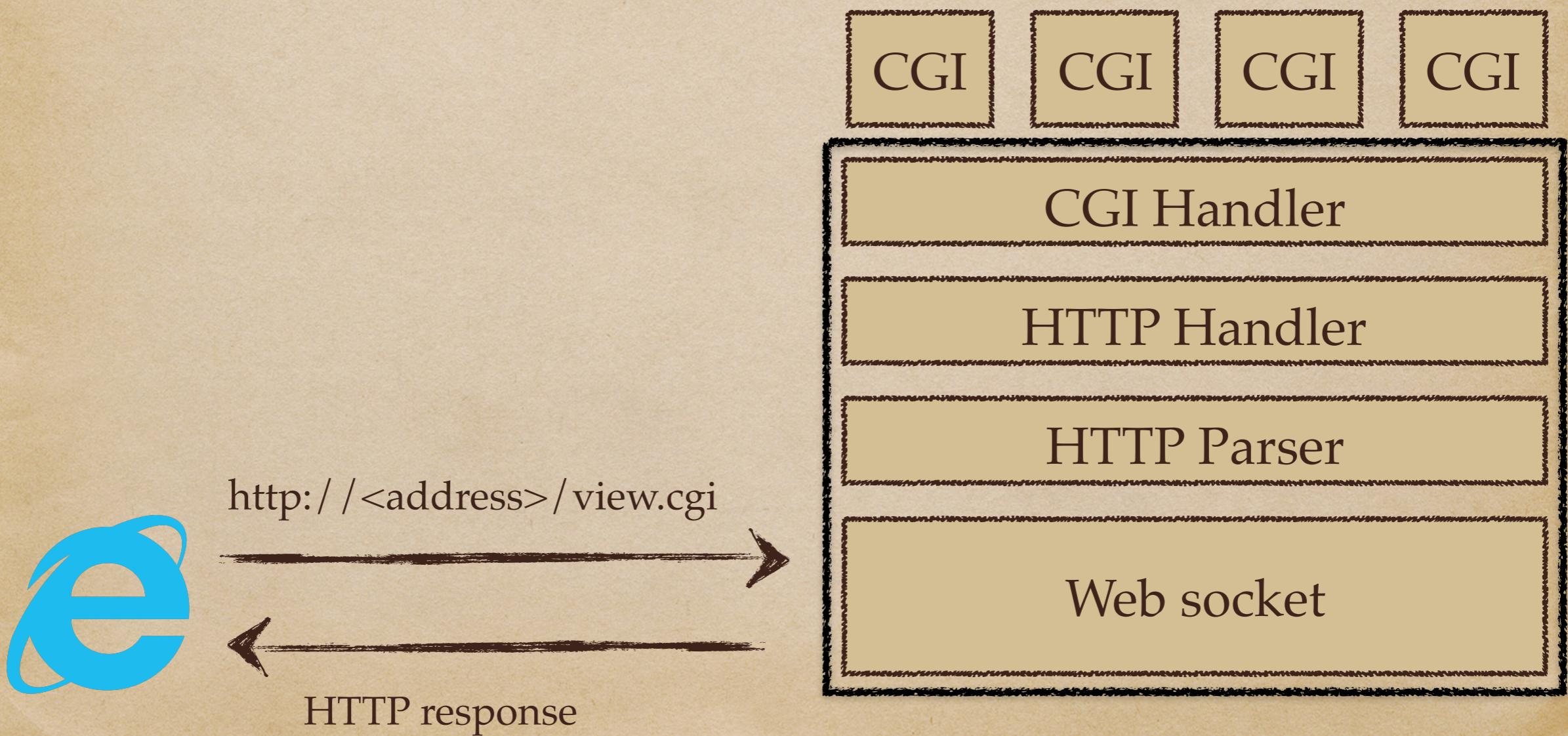
Homework

- 製作小型的 Web server，功能包含：
 - 依照 HTTP/1.1
 - 可接收 Get or Post 請求
 - 實作 CGI 程式
 - 有 Keep-alive 功能 (選)
- 最終目標：建立兩個 cgi 程式可以供client上傳與檢視內容

Homework Arch



Web Server Workflow



CGI Introduce

- Can use any programming language. ex: perl, python, c ...

```
#include <stdio.h>
#include <stdlib.h>
int main(void)
{
    char *data;
    long m,n;
    printf("<TITLE>Multiplication results</TITLE>\n");
    printf("<H3>Multiplication results</H3>\n");
    data = getenv("QUERY_STRING");
    if(data == NULL)
        printf("<P>Error! Error in passing data from form to script.");
    else if(sscanf(data,"m=%ld&n=%ld",&m,&n)!=2)
        printf("<P>Error! Invalid data. Data must be numeric.");
    else
        printf("<P>The product of %ld and %ld is %ld.",m,n,m*n);
    return 0;
}
```

HTTP Method

GET request

```
GET /index.html HTTP/1.1
```

Response

```
HTTP/1.1 200 OK
Date: Mon, 27 Jul 2009 12:28:53 GMT
Server: Apache/2.2.14 (Win32)
Last-Modified: Wed, 22 Jul 2009 19:15:56 GMT
Content-Length: 88
Content-Type: text/html
Connection: Closed
```

```
<html><body>
<h1>Hello, World!</h1>
</body></html>
```

POST request

```
POST /test HTTP/1.1
```

```
Content-Type: application/x-www-form-urlencoded
Content-Length: 27
```

```
field1=value1&field2=value2
```

<https://developer.mozilla.org/zh-TW/docs/Web/HTTP/Methods>
https://www.tutorialspoint.com/http/http_responses.htm

Programing Language

- ◆ C & C++
- ◆ Python (-10)

作業繳交規定

- 請將~~程式碼~~以及報告一起壓縮，並上傳壓縮檔即可
- 壓縮檔請命名為 學號_姓名_HW1
- 報告不限制用什麼編輯軟體但請輸出成 ~~PDF~~

報告內容

- ◆ 建置環境與使用說明
- ◆ 重要程式碼說明
- ◆ 設計架構與功能說明
- ◆ 成果截圖
- ◆ 困難與心得

評分

- ◆ 報告(30%)
- ◆ 程式(60%)，如果使用 python 則為(50%)
- ◆ Bonus(10%)

Review

- Socket server
- Http request & response handler
- CGI program