

# Web Servers

# Introduction

- A web server is specialised software that responds to client (I.e. web browser) requests
- Every web site requires a web server to process client requests and 'serve up' the pages
- Web servers used to service Internet, intranets and extranets
- Note that web server in this context is software. Server machine is also referred to as the web server.

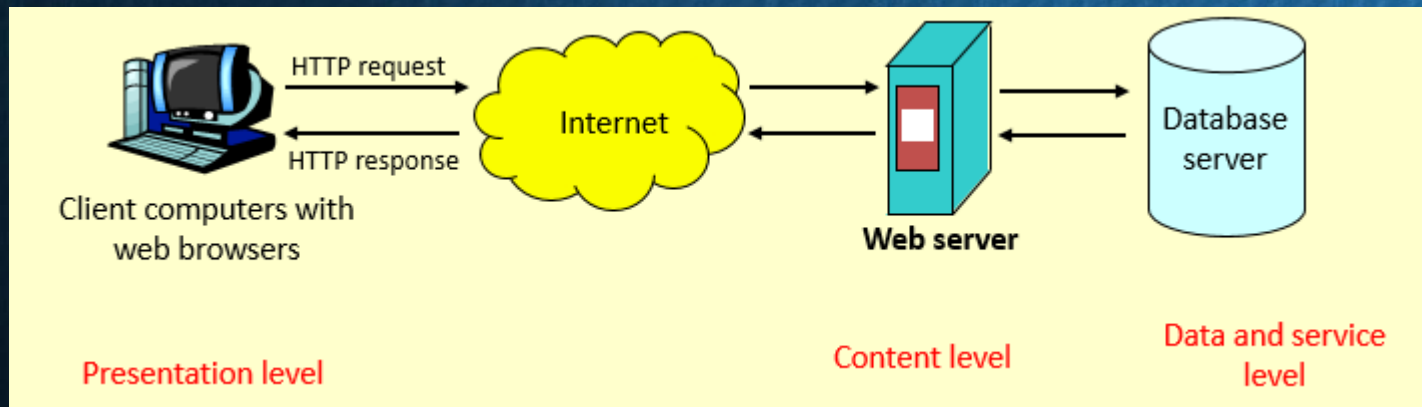


# System architecture

- A web server is part of a multi-tier application (also called n-tier application)
- Functionality is divided into separate tiers or groupings
- Tiers can be on same computer or on separate computers
- Web applications are often three tiered:
  - Information tier (also called data tier)
  - Middle tier
  - Client tier (user interface tier)

# Web architecture

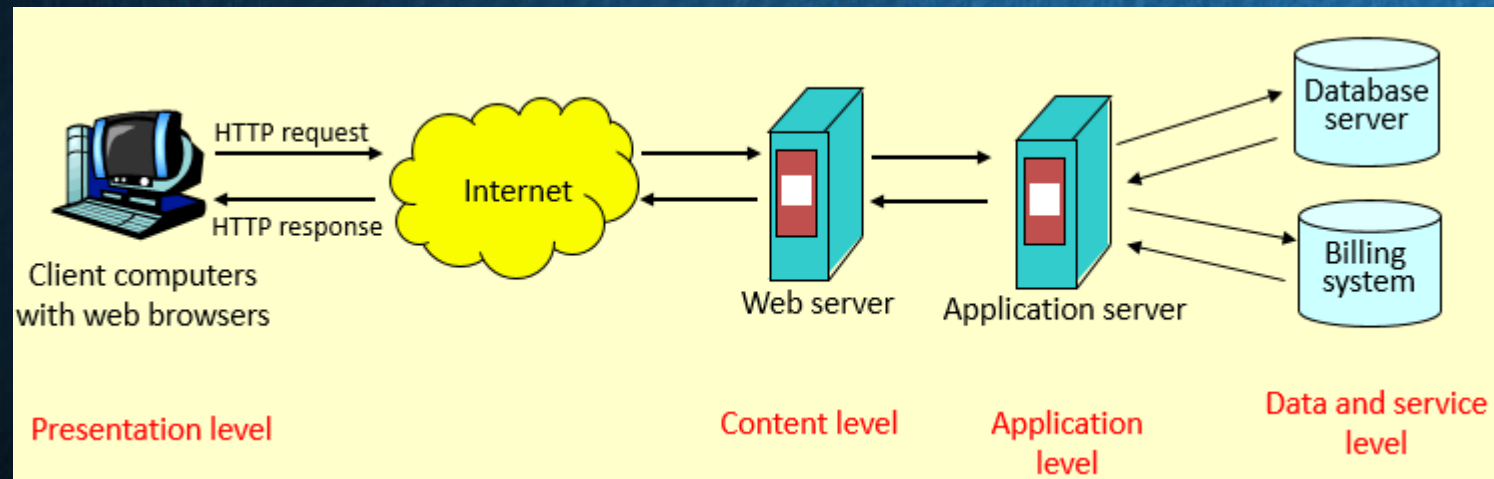
- Three-tier architecture:
- Presentation: clients contains both the presentation and application logic components.
- Content: web server provides interactive view of information from a data store.
- Data and service level: provides data for the web server.



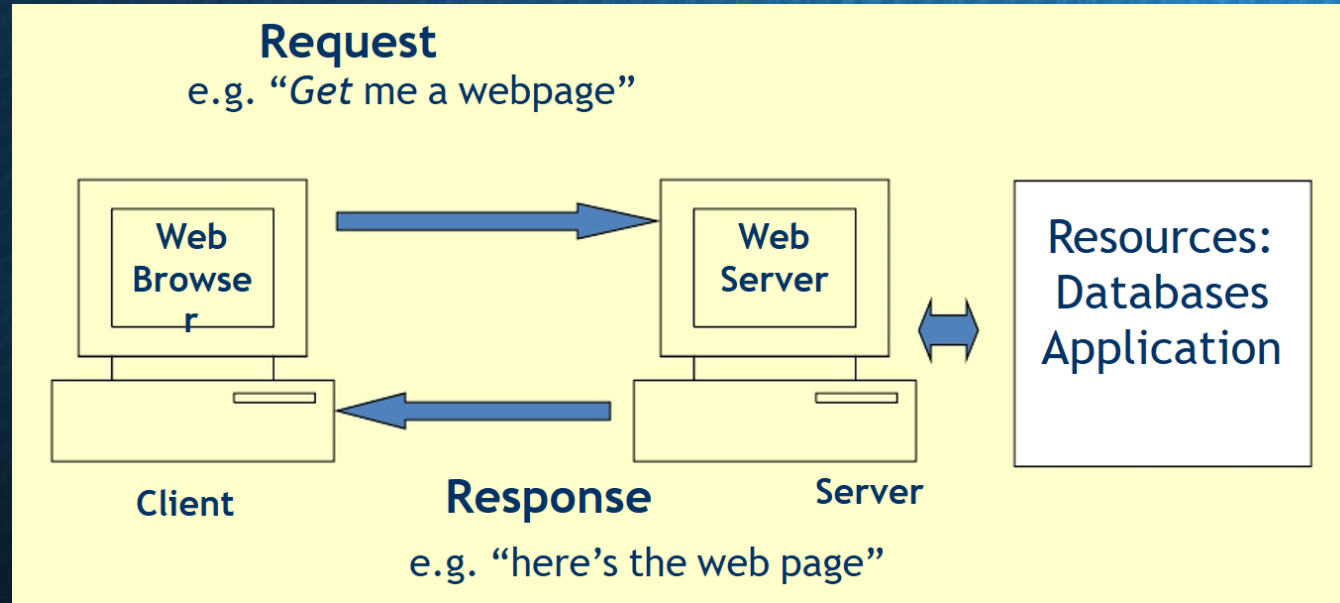


# Web architecture

- Multi-tier architecture:
- Application-level or middleware: has an application server, which is used to find requested data and services, makes them available for viewing, and carries out transactions.
- Data and service level: has a variety of data and services accessible by the application server.



# Hyper Text Transfer Protocol



- Basic function of web server is to act as HTTP server
- Web servers communicate with clients using a Response-Request protocol: HTTP



# Client-Server model and HTTP

- A request is generated by a client (by browser software)
  - Most common requests are “Get” and “Post”
- Request reaches the appropriate web-server
- Request is processed by the web-server back to the client (e.g. web page contents)

# Client-Server model and HTTP

- HTTP is the de facto standard for transferring World Wide Web documents
- Usually to port 80
- HTTP messages (requests and responses) between client and server are human readable



# Http: Requests from client: HTML Examples

```
<body>
```

```
<form    method="post" action = "process.jsp">
```

```
Word to look up:<input type = text Name = "word">
```

```
<input types = "submit">
```

```
</form>
```

```
</body>
```

HTML code  
for a form

Indicates a post request  
Data in form is posted to the  
server

# Http: Requests from client: HTML Examples

```
<body>
```

```
<form    method="get" action = "process.jsp">
```

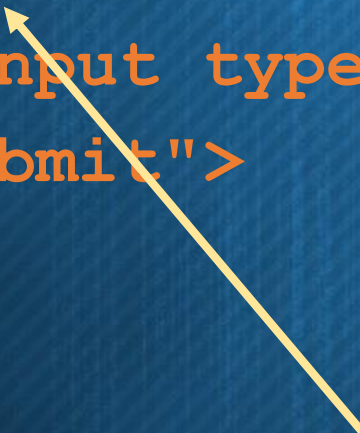
```
Word to look up:<Input type = text Name = "word">
```

```
<input types = "submit">
```

```
</form>
```

```
</body>
```

HTML code  
for a form



Indicates a get request  
Not usually used for forms  
Sends any parameters in the query  
string as  
www.hostname?name=word& etc



# Http: Response from web server

## ➤ Response

➤ 200 = Status code

➤ All's well

## ➤ Type of server

## ➤ Other contents etc

**HTTP/1.1 200 OK**

**Date: Thu, 07 Oct 2021 09:40:55 GMT**

**Server: Apache 1.3.5 (Unix) PHP/3.0.6**

**Last-Modified: Mon, 04 Oct 2021 16:03:22 GMT**

**Content-Type: text/html**

**Content-Length: 12987**

...



# HTTP Response Status Codes

- 1XX: Provide information to the client
- 2XX: Correct response has occurred.
- 3XX: Browser must carry out some further action in order for the request to be successful. For example, the code 301 indicates that the resource that was requested has been permanently moved to another location.
- 4XX: Something has gone wrong; for example, the most frequent status code that is returned is 404 which indicates that the resource that has been requested cannot be found.
- 5XX: Server has experienced a problem. For example, the status code 503 indicates that the service requested has not been able to be carried out.



# Accessing web servers

- Must know host name on which web server resides

- Remote web servers accessed using
  - URL: `http://www.tudublin.ie/default.asp`
    - Protocol** (points to `http`)
    - Domain name** (points to `www.tudublin.ie`)
    - Page name** (points to `default.asp`)
  - OR IP address `http://207.60.134.230`
- Local web servers (on same machine) accessed using machine name or `localhost`

# Leading web servers

Server	Vendor	Comment
Apache	Freeware	Free, most used web server
IIS	Microsoft	Bundled with Windows, operating system. Supports Active Server Pages
Google		It's a custom Linux based web servers.
And Nginx, WP Farm...		



# Selecting a web server: Performance

- How many client requests per second can be processed? Load balancing?

# Selecting a web server: Reliability

- How robust is the web server?
- How liable to crash?
- How easily recovered?



# Selecting a web server: Ease of Use

- How easy to set up , administer, learn?

# Selecting a web server: Support

- What support is provided by the vendor?



# Selecting a web server: Price

- How much does it cost to buy and maintain?

# Selecting a web server: Price

- How much does it cost to buy and maintain?



## Selecting a web server: Security

- What security functionality is offered? Online IT security services.

# Selecting a web server: Functionality

- server side technologies supported? (as add-ons? – e.g. XAMPP for Apache) e.g. ASP? JSP? CGI? etc
- Logging
- Proxy server



# Selecting a web server: Operating system

- What operating system(s) does the web server support?
- See <https://www.serverwatch.com/servers/> for examples of assessments

# Question

- Development selecting a new web server: Currently using websites built in JSP, running on Blazix web server, running on Linux servers. The number of users is trebling every two months and they now want to upgrade to an industry standard web server. Their parent company uses Internet Information Server and would like them to use IIS
- Considerations? Issues?