



# Web Technologies Basics

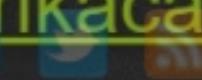
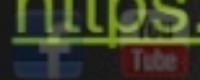
## Concepts

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## HTML Basics

Telerik Software Academy

<https://telerikacademy.com>





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# Web Page

- Web Pages

- Are documents or information resources that are suitable for the World Wide Web
- Can be accessed through a web browser and displayed on a monitor or a mobile device
- This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links
- Web pages frequently refer to other resources such as style sheets (CSS), scripts (JavaScript) and images into their final presentation

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# Web Site

- Web Sites
  - Are **collections** of related web pages containing web resources (web pages, images, videos, CSS files, JS files or other digital assets)
  - Have **common navigation** between web pages
  - Are **hosted** on at least one **web server**
  - Are accessible via a network (such as the Internet)
- **All publicly accessible websites** collectively constitute the **World Wide Web**

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# Web Application

- Web Application
  - Next level web sites
  - High interactivity
  - High accessibility (Cloud)
  - AJAX, Silverlight, Flash, Flex, etc.
  - Applications are usually broken into logical chunks called "tiers", where every tier is assigned a role
  - Desktop-like application in the web browser



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# Web Browsers and Layout Engines



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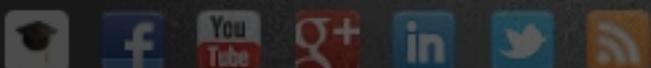




# Web Browsers

- A Web browser is a program designed to enable users to **access**, **retrieve** and **view** documents and other resources from the Web
- Main responsibilities:
  - **Bring** information resources to the user (issuing requests to the web server and handling any results generated by the request)
  - **Present** web content (render HTML, CSS, JS)
  - **Capable of executing** applications within the same context as the document on view (Flash)

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# Layout Engines

- Layout Engines are software components that **displays the formatted content** on the screen combining:
  - Marked up content (such as HTML, XML, image files, etc.)
  - Formatting information (such as CSS, XSL, etc.)
- It "paints" on the content area of a window, which is displayed on a monitor or a printer
- Typically embedded in web browsers, e-mail clients, on-line help systems or other applications that require the displaying (and editing) of web content
- The layout engine is the "heart of a browser"

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# Layout Engines and Web Browsers

- Trident-based
  - Internet Explorer, Netscape, Maxthon, etc.
- Gecko-based
  - Firefox, Netscape, SeaMonkey, etc.
- Blink-based
  - Chrome, Opera
- WebKit-based
  - Safari, iOS, Maxthon, Chrome (up to v27), etc.
- EdgeHTML (fork of Trident)
  - Microsoft Edge

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- Identify web browsers and their version
  - History of (in)compatibility attempts
- Can have some additional information like layout engine, user's operating system, etc...

```
Mozilla/5.0 (Windows NT 6.3; WOW64) AppleWebKit/537.36 (KHTML, like Gecko)  
Chrome/41.0.2272.118 Safari/537.36
```

- Mozilla/5.0 – a generic term which most modern browsers use (originally indicated Netscape)
- Windows NT 6.3 – Windows 8.1
- WOW64 – Windows-On-Windows 64-bit
- AppleWebKit/537.36 – Blink is a fork of WebKit
  - KHTML is the previous name of WebKit
- Chrome/41.0.2272.118 – real browser version
- Safari/537.36 – artifact against scripts sniffing





# Hardware Servers



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# Hardware Servers

- A hardware server is a **physical computer** dedicated to running one or more such services
- Servers are placed in colocation centers
  - Colocation facilities provide space, power, cooling, and physical security for the server
- The server may be:
  - Database server
  - File server
  - Mail server
  - Print server





# Web Servers

Apache, IIS, nginx, lighttpd, etc.



IIS7

LIGHTTPD  
fly light.





# What Do the Web Servers Do?

- All physical servers have hardware
- The hardware is controlled by the operating system
- Web servers are software products that use the operating system to handle web requests
  - Web servers serve Web content
- These requests are redirected to other software products (ASP.NET, PHP, etc.), depending on the web server settings

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# Web Servers Market Share October 2015

- Market share of the top million busiest sites
  - Apache
    - 47.18% (469,050)
  - nginx
    - 23.36% (236,650)
  - IIS (by Microsoft)
    - 11.64% (116,321)
  - GWS (by Google)
    - 2.25% (22,304)

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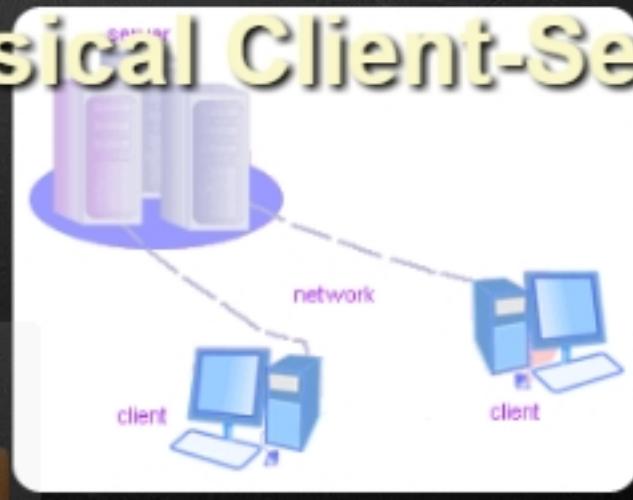
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# Client-Server Architecture

## The Classical Client-Server Model



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# Client-Server Architecture

- The client-server model consists of:
  - A server
    - A single machine or cluster of machines that provides web applications (or services) to multiple clients
    - *Examples:*
      - Web server running PHP scripts or ASP.NET pages
      - IIS-based Web server
      - WCF-based service
      - Services in the cloud

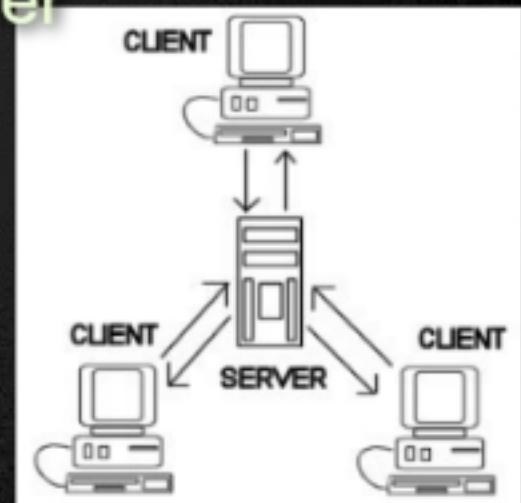
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# Client-Server Architecture

- The client-server model consists of:
  - **Clients**
    - Software applications that provide UI (front-end) to access the services at the server
    - *Examples:*
      - Web browsers
      - Desktop applications
      - HTML5 applications
      - Silverlight applications
      - ASP.NET consuming services

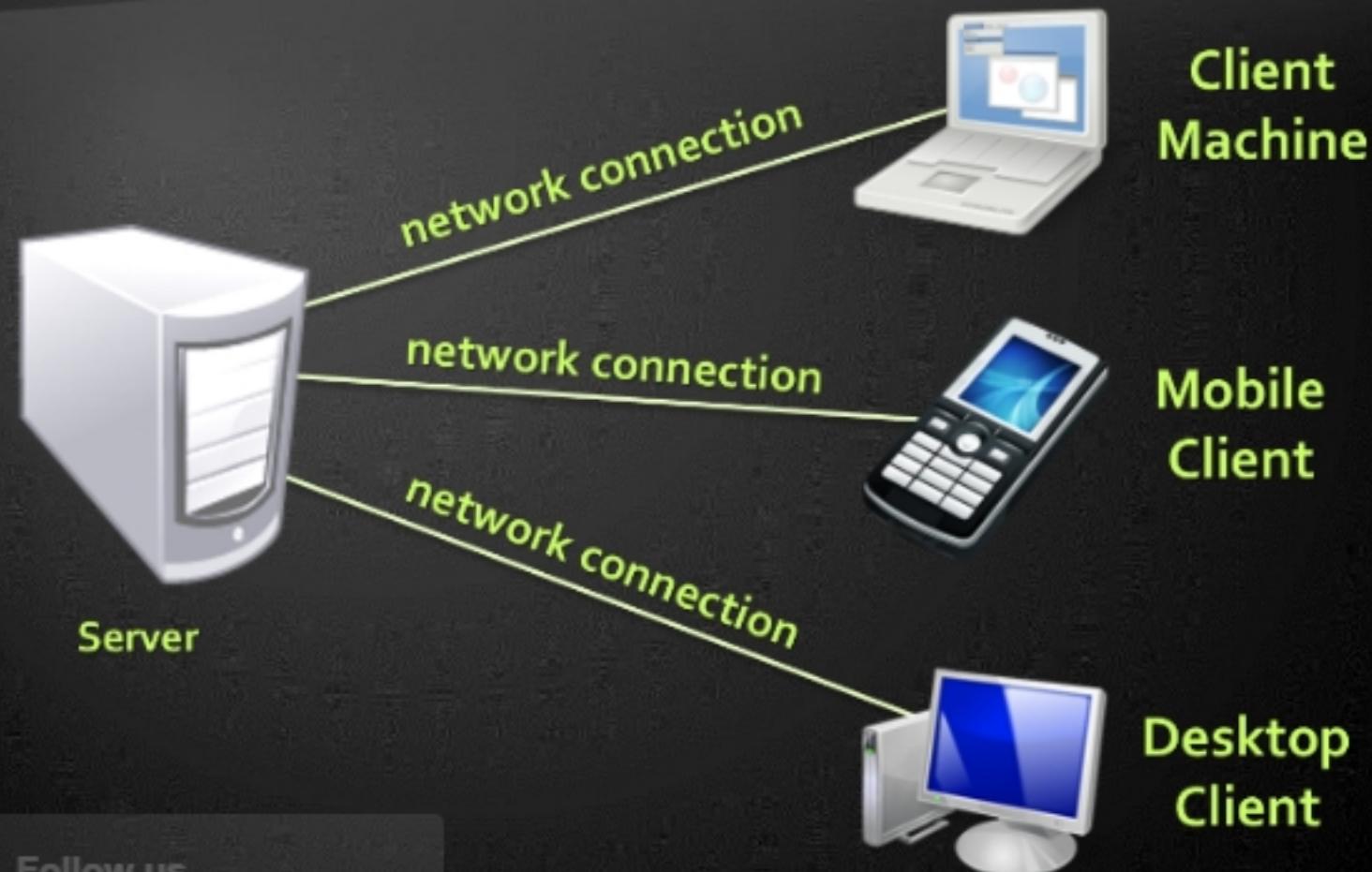


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# The Client-Server Model

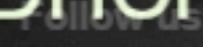
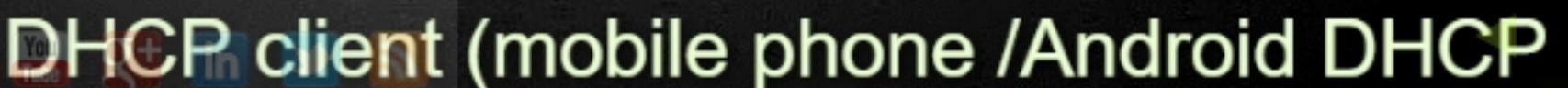


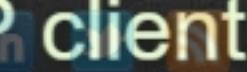
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# Client-Server Model: *Examples*

- Web server (Apache, IIS) – Web browser
- FTP server (ftpd) – FTP client (FileZilla)
- EMail server (qmail) – email client (Outlook)
- SQL Server – SQL Server Management Studio
- BitTorrent Tracker – Torrent client ( $\mu$ Torrent)
- DNS server (bind) – DNS client (resolver)
- DHCP server (wireless router firmware) –  





# What is "Cloud"?



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# What is Cloud?

- **Cloud** ≈ multiple hardware machines combine their computing power and resources
  - Share them between multiple applications
  - To save costs and use resources more efficiently
- **Public clouds**
  - Provide computing resources on demand
    - Publicly in Internet
    - Paid or free of charge (to some limit)
  - Amazon AWS, Google App Engine, Microsoft Azure, Rackspace, PHPFog, Heroku, AppHarbor

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# Cloud Computing Models

- Infrastructure as a Service (IaaS)
  - Virtual machines in the cloud on demand
  - Users install the OS and software they need
- Platform as a Service (PaaS)
  - Platform, services and APIs for developers
  - E.g. Java + JBoss + JSF + JPA + MongoDB or JavaScript + Node.js + MongoDB + RabbitMQ
- Software as a Service (SaaS)
  - Hosted application on demand (e.g. WordPress)

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