SWINBURNE UNIVERSITY OF TECHNOLOGY

COS10005
Web Development

Module 1 - Introduction

Contents

- What is the Internet?
- What is the World Wide Web?
- What else is there apart from the Web?
- Understanding Web Development
- Language versions
- Getting Started

WHAT IS THE INTERNET?

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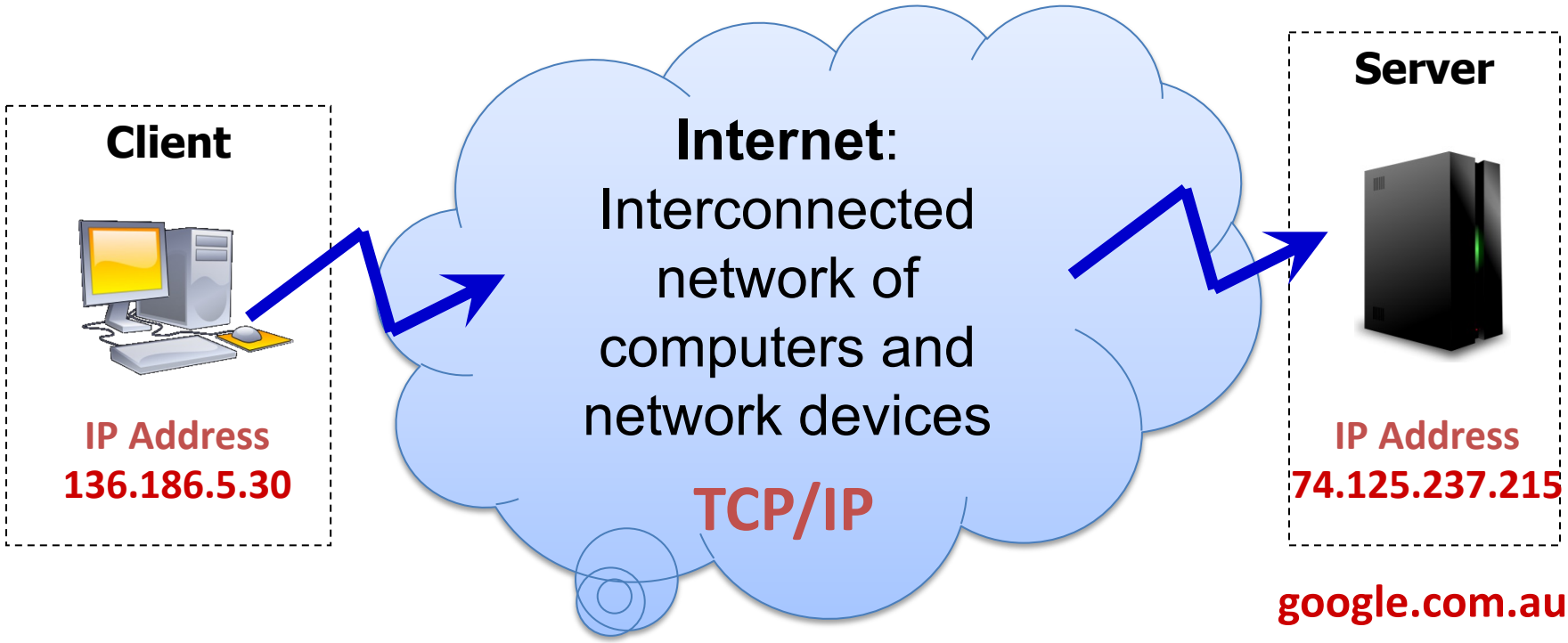
Internet – The Network

It is a massive network of networks



Message interception possible!!!

In simple terms:

TCP *handles the messages*

IP *handles the delivery*

Question: Do cell phones have IP addresses?

Internet – Protocols

- To help understand how information travels over the Internet, a knowledge of the **Internet protocol suite** is needed.
- The **Internet protocol suite** is the networking model and a set of *communication protocols* used for the *Internet* and similar networks.
- It is commonly known as TCP/IP, because of its most important protocols: ***Transmission Control Protocol (TCP)*** and ***Internet Protocol (IP).***
- The Internet has four abstraction layers which are used to sort all Internet protocols according to the scope of networking provided.

Internet – Layers and Protocols

Application

- DHCP DHCPv6 DNS FTP HTTP IMAP IRC LDAP MGCP NNTP BGP NTP POP RPC RTP RTSP RIP SIP SMTP SNMP SOCKS SSH Telnet TLS/SSL XMPP *and more*

Transport

- **TCP** UDP DCCP SCTP RSVP *and more*

Internet

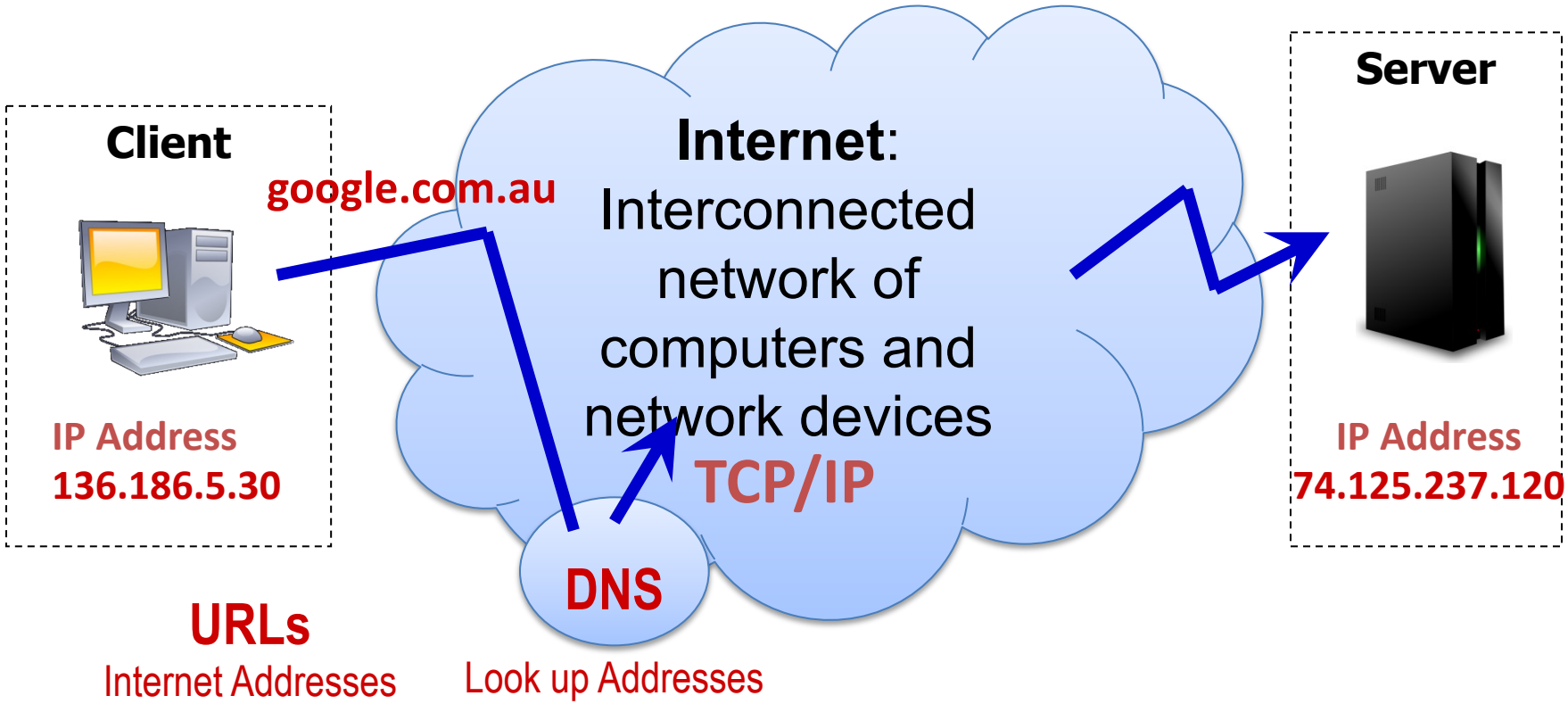
- **IP (IPv4 IPv6)** ICMP ICMPv6 ECN IGMP IPSE *and more*

Link

- ARP/InARP NDP OSPF Tunnels (L2TP) PPP
  Media access control (Ethernet DSL ISDN FDDI) *and more*

Internet – Domain Name System (DNS)

DNS, URLs



THAT WAS THE INTERNET.

BUT …
WHAT IS THE **WORLD WIDE WEB**
OR THE **WEB**?

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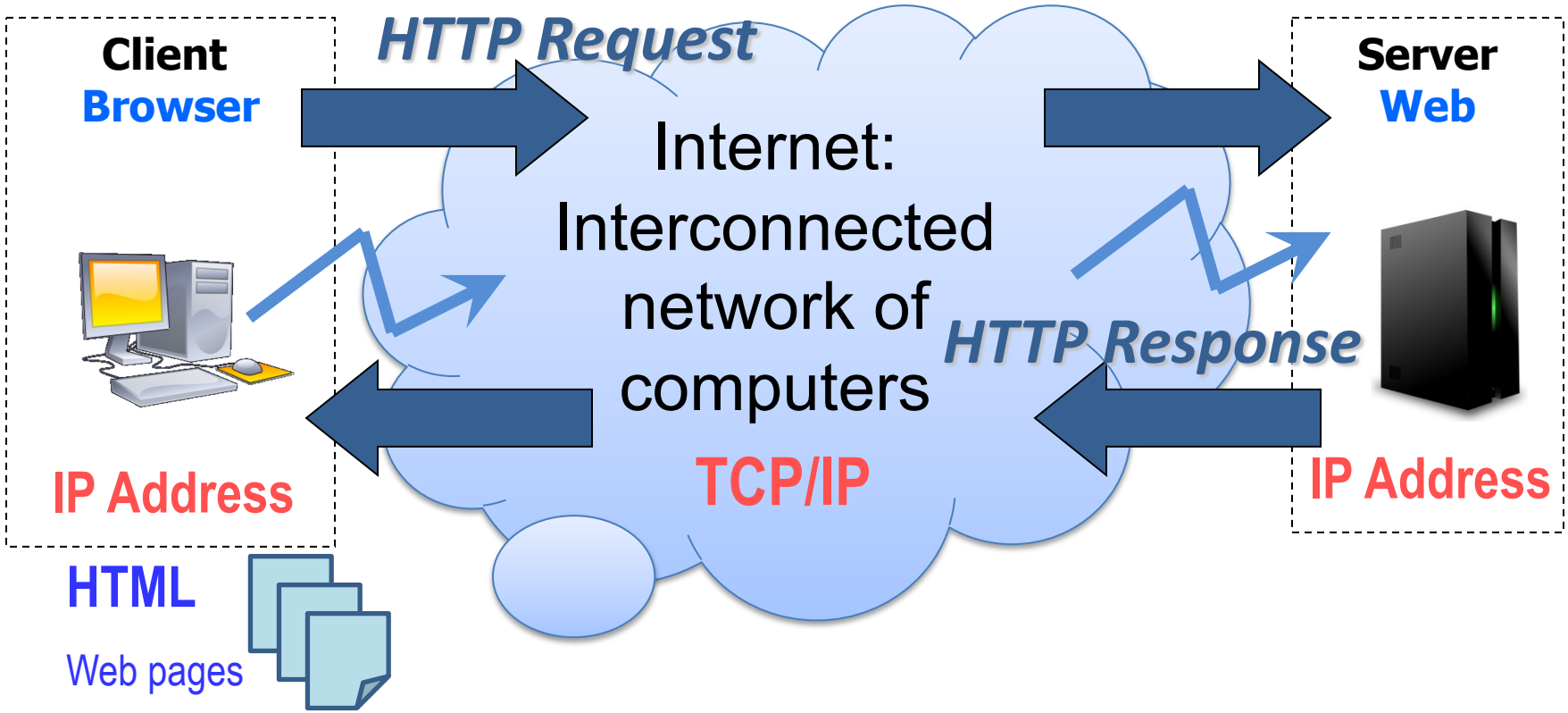
The Web – The Method

A way of accessing information over the Internet.



Uses the **HTTP Protocol**

The Web – Its Terminology

Websites are collections of related **Web documents**

put together for a specific purpose. The location on the Internet of the Web pages and related files

- *There are many different purposes for Web sites including scientific publication, education, ecommerce, entertainment, social networking, political campaigns etc.*

The Web – Its Terminology

Web Pages (Web documents) are files created using

- ***HyperText Markup Language (HTML)***
  used to mark-up page ***structure*** and ***content***
- ***Cascading Style Sheets (CSS)***
  used to mark-up page ***presentation***
- ***JavaScript*** (for client-side scripting)
  used to ***enhance*** web user ***interaction***.

The Web – Its Terminology

Web Documents – are **Hypertext** documents.

Hypertext is text that can act as a **link** (or **hyperlink)** to another document location.

- With hypertext you can skip from one topic to another in any order that suits ***you*** and ***your objectives***
- Hyperlinks may point to another part of the *same document*, or point to *another entirely different document* (on the *same* computer or on *another* computer). Click to see a web page with two types of links.
- Hyperlinks can trigger specific functions provided by the website.

The Web – Its Terminology

Uniform Resource Locators (URLs) are strings used to identify the locations of unique resources on the web, e.g., web pages and image files.

- To complete the URL, we include the protocol at the start of the URL value.

http://mercury.ict.swin.edu.au/cos10005/qhe/lab01/info.html#ex01

protocol **server** **path** **filename** **id**

The Web – Its Software

- **Web Browsers** (on a **personal device** as a client)
  - Send HTTP requests
  - Receive HTTP responses
  - Interpret and render/display completed Web Documents
  - *Popular Browsers:* ***Chrome****,* ***Firefox****, Safari, Internet Explorer, Opera*
- **Web Servers/HTTP Servers** (on a remote computer as a server)
  - Receive HTTP requests
  - Retrieve or create Web Documents Manage and make HTTP responses
  - *Some popular Web server software is*
    Apache HTTP Server (Apache)
    Microsoft Internet Information Services (IIS) *for Windows*

The Web – Its Protocol

- **Hypertext Transfer Protocol (HTTP)**
  - The key "protocol" that manages the **request/response** exchange between **browsers** and **servers**
- **Hypertext Transfer Protocol Secure (HTTPS)**
  - HTTP secured with data encryption

WHAT ELSE IS THERE IN THE INTERNET APART FROM THE WEB?

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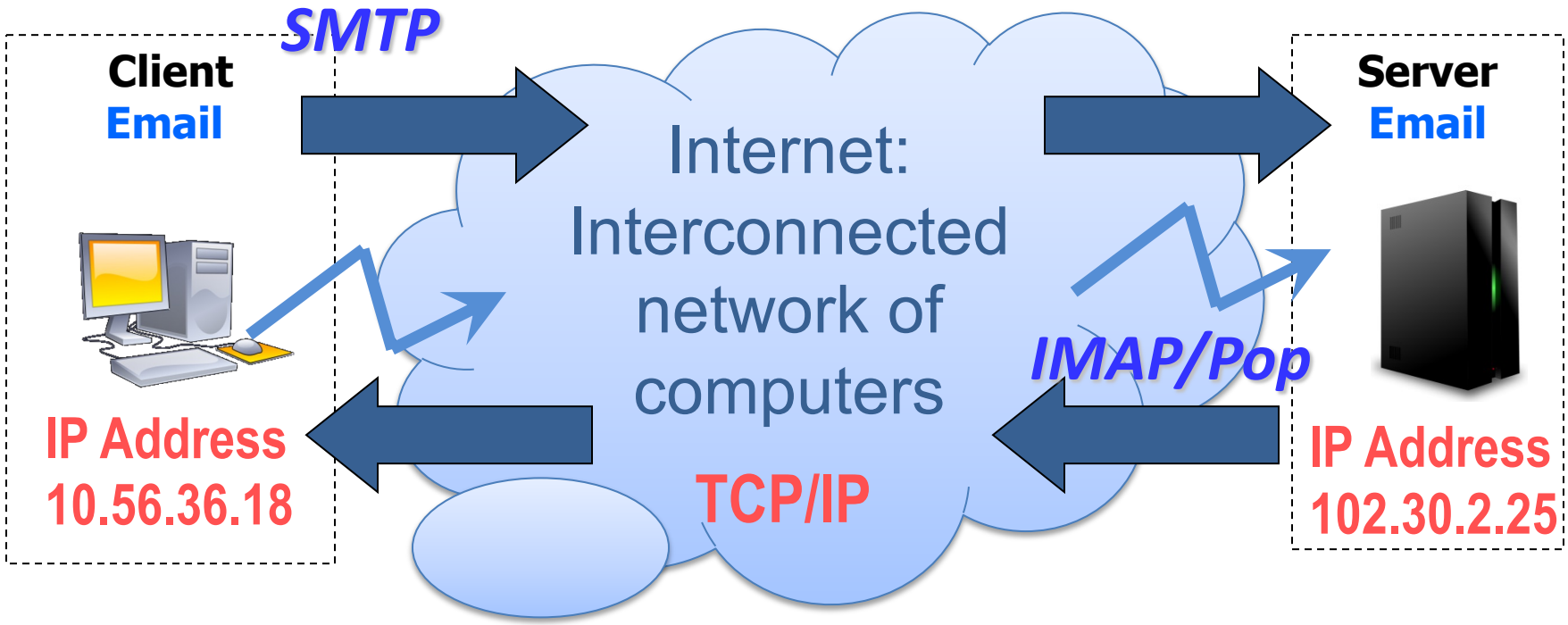
What else? – Email

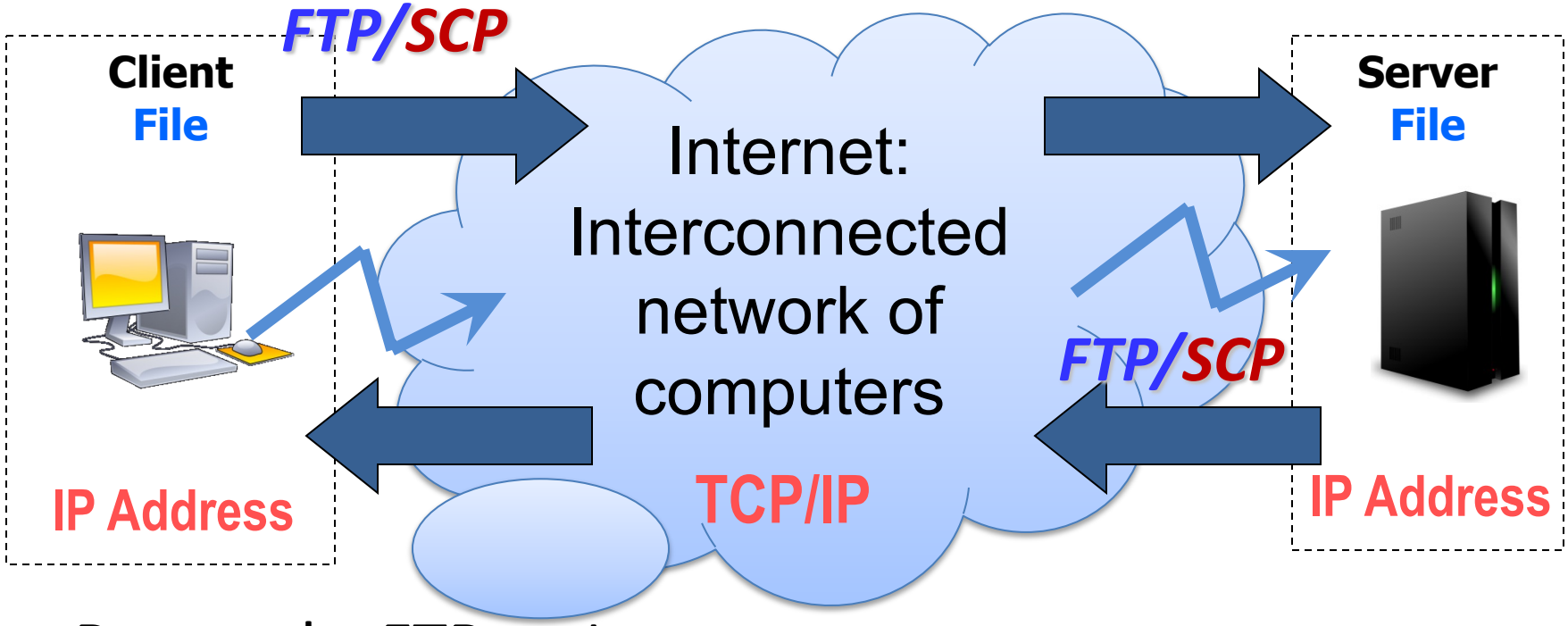
- is a way of doing email over the Internet



- Uses the SMTP and IMAP/POP Protocols
- Popular applications: gmail.com and outlook.com

What else? – Online Storage

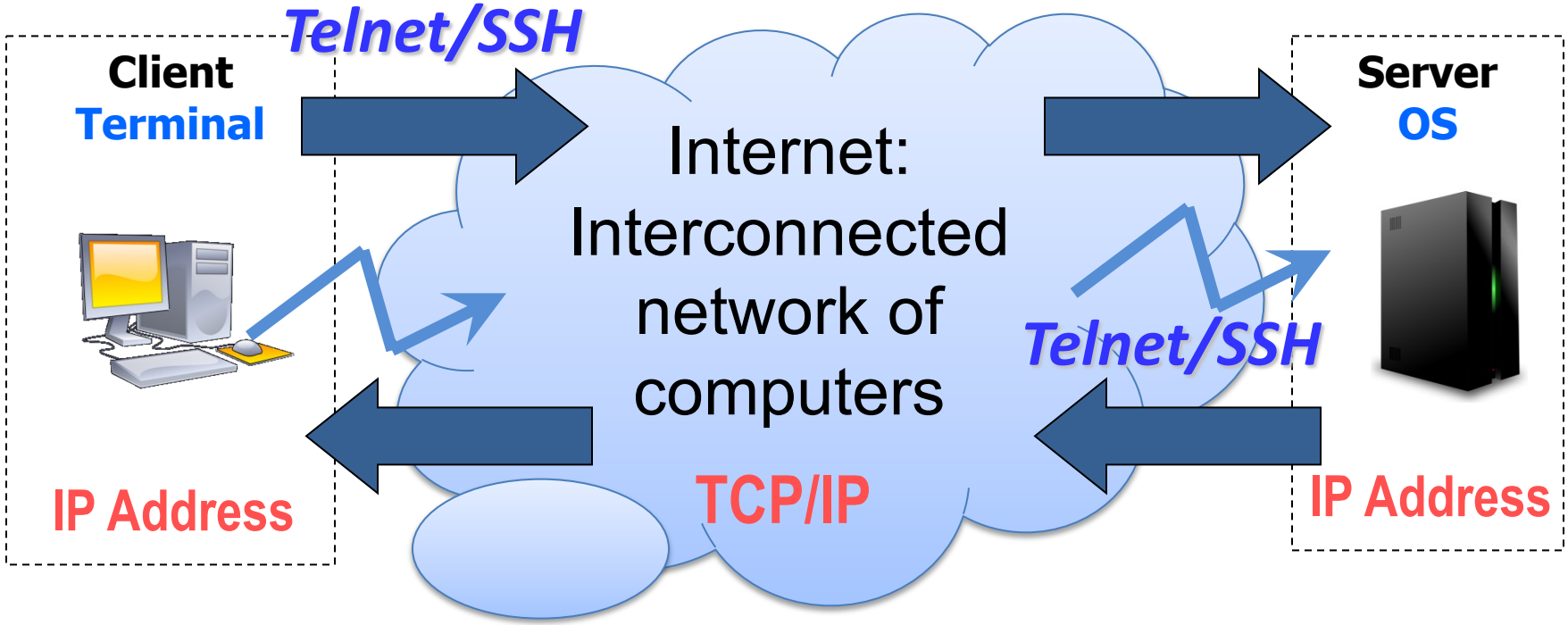
- is a way of transferring files over the Internet.



- Protocols: FTP and SCP
- Popular applications: Dropbox, Google Drive and OneDrive (formerly SkyDrive)

What else? – Remote Access

- is a way of controlling another machine over the Internet.



- Uses the Telnet or SSH Protocols
- Popular applications: LogMeIn, Microsoft Remote Desktop and Chrome Remote Desktop

UNDERSTANDING WEB DEVELOPMENT

WHO SHOULD I BECOME?

WHAT HARDWARE SHOULD I HAVE?

WHAT SOFTWARE SHOULD I INSTALL?

WHAT LANGUAGE SHOULD I LEARN?

Web Development

- The People
- The Hardware
- The Software
- The Languages

Web Development – The People

- **Web developers** are a programmers who specialise in the development of websites. Their focuses are:
  - Robust backbone
  - Satisfactory performance
  - Technically sound code
- **Web Designers are** people that has knowledge of designing visually appealing websites. There focuses are:
  - Layout
  - Color scheme
  - User-friendliness

Web Development

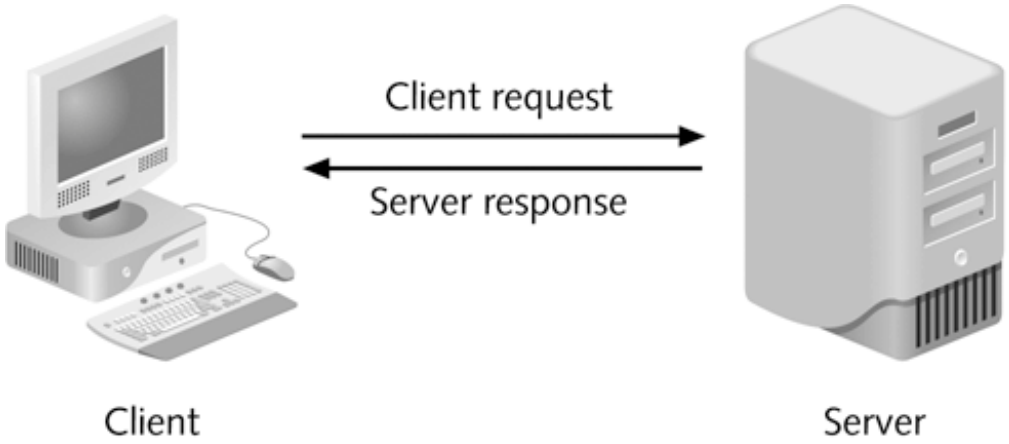
- The People
- The Hardware
- The Software
- The Languages

Web Development – The Hardware

- **Server** (“back end”)
  - Responsible for data storage and management, often has a database from which a client requests information
  - Fulfills a request for information by managing the request or serving the requested information to the client
- **Client** (“front end”)
  - Presents an interface to the user
  - Gathers information from the user, submits it to a server, then receives, formats, and presents the results returned from the server

Web Development – The Hardware

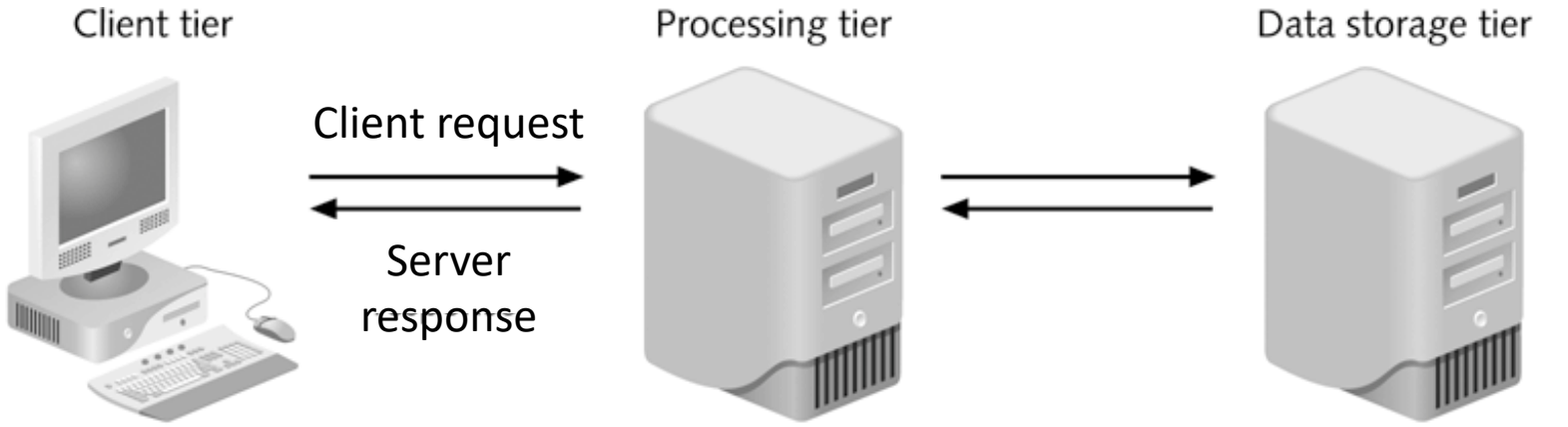
- A system consisting of a client and a server is known as a **two-tier** system



The design of a two-tier client/server system

- Note the client and server are referring to the physical machine in this illustration

Web Development – The Hardware



IP usually dynamically assigned by ISP, e.g., Telstra, Optus and TPG

Fixed public IP
136.186.123.37
mercury.swin.edu.au

Fixed public IP
136.186.123.38
mysql.swin.edu.au

The design of a **three-tier** client/server system

Safety, Consistency and Cost

Web Development

- The People
- The Hardware
- The Software
- The Languages

Web Development – The Software

- **Client software** refers to the software the runs on the client machines to communicates with a server, examples are
  - **OS** – (Windows, Linux, OSX)'s telnet, FTP
    - Third party – putty, WinSCP, CyberDuck
  - **Web Browsers** – Internet Explorer, Firefox, Chrome, Opera, Safari

Web Development – The Software

- **Server software** refers to software that run on the server machines, including:
  - **OS**: Windows Server, Linux Server
  - **Web:** Apache, Microsoft Internet Information Services
  - **Database:** MS SQL SERVER, ORACLE, MySQL
  - **Script Support:** NodeJS (JavaScript), Apache Tomcat (Java Server Pages (JSP)), Microsoft ASP (Active Server Pages), Adobe ColdFusion, Perl, PHP, Python, Ruby

Web Development

- The People
- The Hardware
- The Software
- The Languages

Web Development – The Languages

- **HyperText Markup Language (HTML)** is a markup language designed to specify structure and content of a web page
- **Cascading Style Sheets (CSS)** a style sheet language for describing the look and formatting (e.g., fonts, colors, spacing) of Web documents.
- **Client-side scripting (JavaScript)** is a language often used to allow web pages to interact with users.

Content

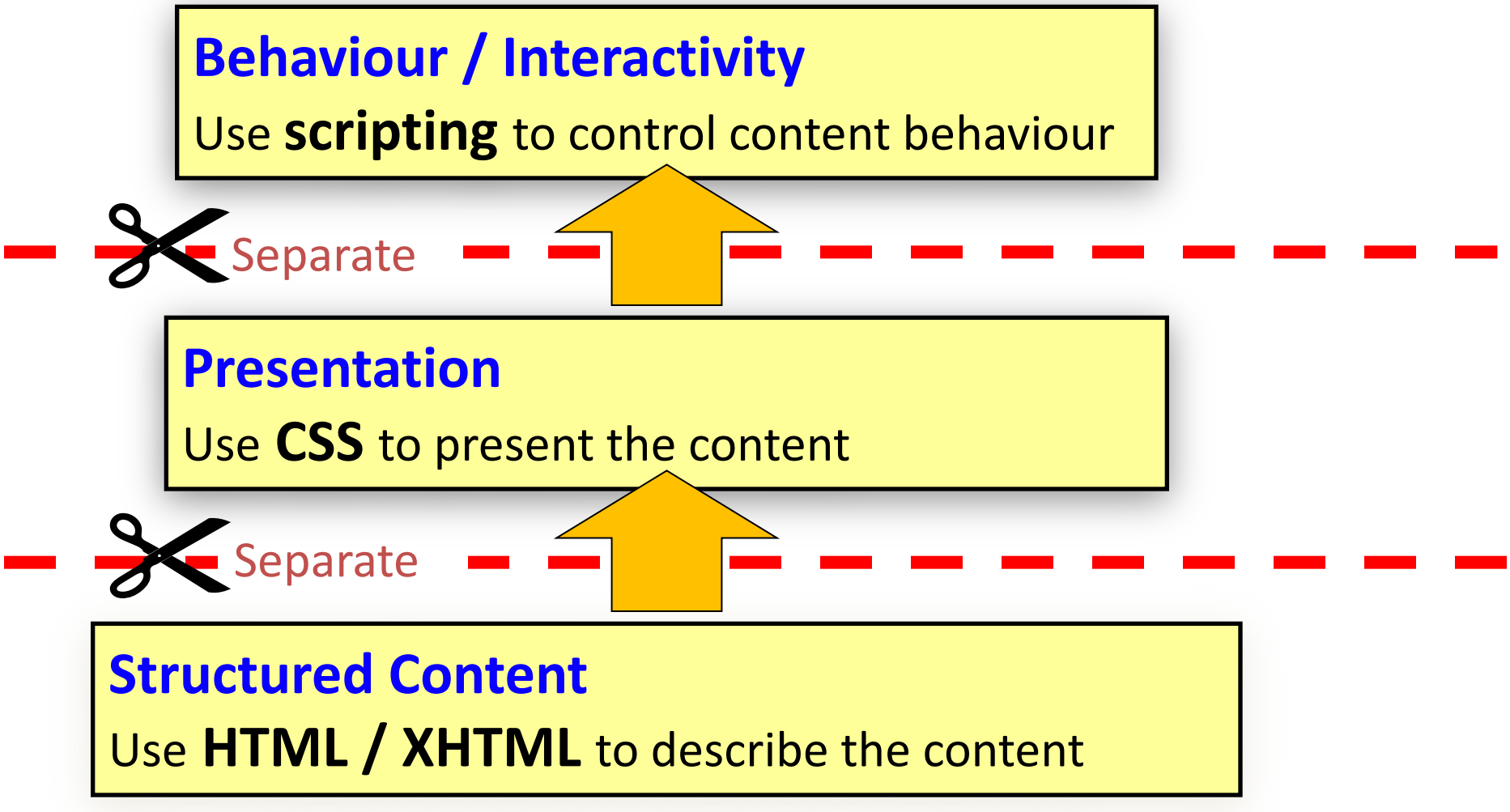
Presentation

Interactivity

Web Development – The Languages

- **JavaScript** is a *client-side* scripting language that is primarily used to add interactivity to web pages.
- **JavaScript** allows you to:
  - Turn static Web pages into applications, such as games or calculators. Change the contents of a Web page after a browser has rendered it
  - Create visual effects such as animation
  - Control the Web browser window itself

Web Development – The Process



LANGUAGE VERSIONS

Which HTML?

Timeline	HTML	XHTML
1995	2.0	
1997	3.2	
1997-1998	4.0 Strict, Transitional, Frameset)	
1999	4.01	
2000		1.0
2001		1.1
2008	5.0 (Draft)	
2009		2.0 (abandoned , incompatible with 1.x)
2014	5.0	
2016	5.1	
2017	5.2	

Understand HTML 4.01

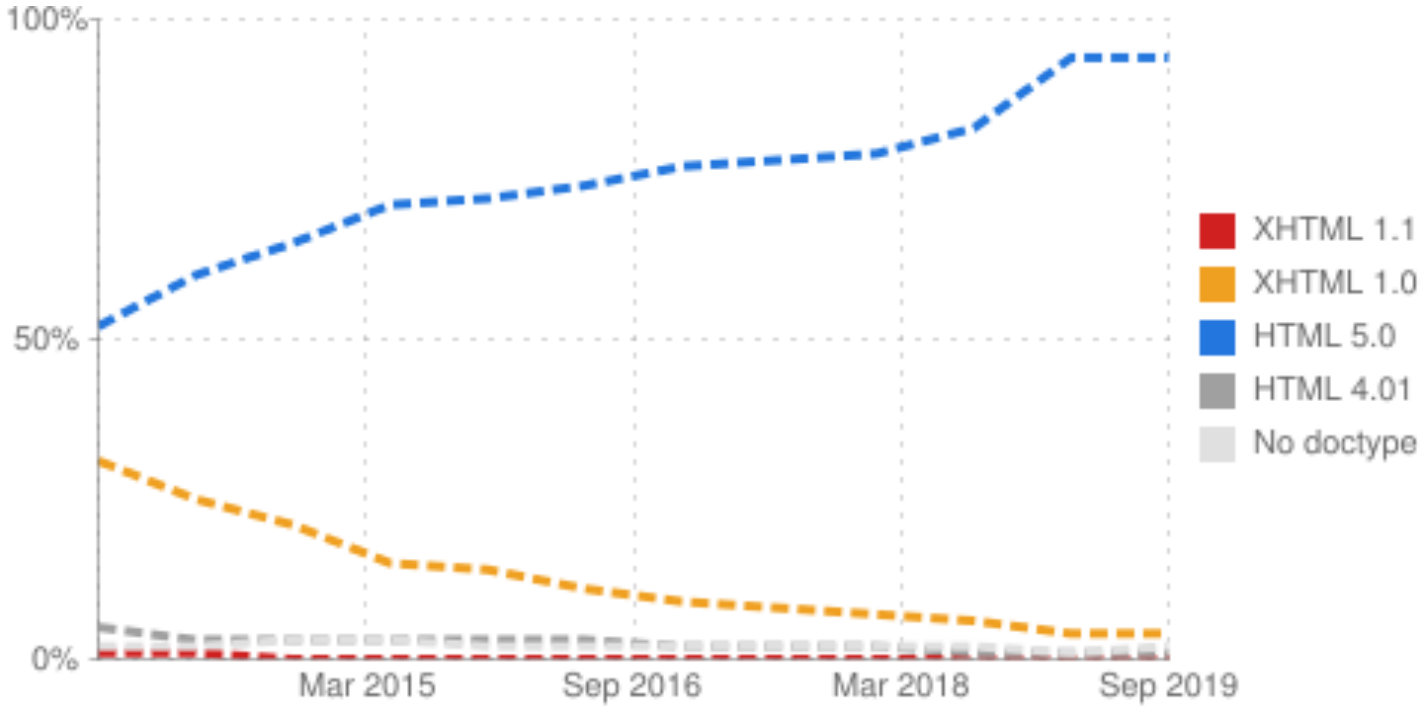
```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML
4.01//EN"
"http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
<title>Title of document</title>
</head>
<body>
</body>
</html>
```

Understand HTML5

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <title>Title of document</title>
</head>
<body>
</body>
</html>
```

You can use it as a template for your web pages!

HTML5 vs. HTML4 vs. XHTML1.0



Source: https://try.powermapper.com/stats/HtmlVersions

What about CSS?

Timeline	Version	Capabilities
1996	CSS1	Font, Alignment, Margin, Border
1998	CSS2	Positioning, z-index
2011	CSS2.1	fixes errors in CSS 2
2012	CSS3	Media Queries, Namespaces, Selectors Level 3, Colour
	CSS4?	

And JavaScript?

Timeline	Version
March 1996	1.0
August 1996	1.1
June 1997	1.2
October 1998	1.3
	1.4 (Server side only)
November 2000	1.5
November 2005	1.6
October 2006	1.7
June 2008	1.8
February 2009	1.8.1
June 2009	1.8.2
July 2010	1.8.5

GETTING STARTED

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Getting Started – Software Installation

- **Server Software**
  - **Web Server** (Apache) to host your web page
    - University's web server
      URL: http://mercury.swin.edu.au
- **Client Software**
  - **Web Browser:** Mozilla Firefox with Web Developer add-on to view the web page.
  - **File Transfer** (WinSCP or Filezilla) to securely transfer the web page files to the server
  - **Text Editor** (Notepad++ or Sublime) to edit the web page code

WHAT'S NEXT?
– LEARNING HTML

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