

Web Programming

Chapter 1: Introduction

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Chapter Description

- Expected Outcome
 - Able to understand the beginnings of the World Wide Web, Internet and its components



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Evolution of the Internet and World Wide Web

- The evolution of the smart phone in the last 10 years had made the Internet as an important element in our lives.
- The Internet and the World Wide Web had a long history



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From ARPANET to Internet

(A brief history of internet)

- Internet originated from ARPANET (Advanced Research Projects Agency Network) project.
- ARPANET was launched by U.S. ARPA (Advanced Research Projects Agency) in 1969.
- The purpose of ARPANET was to network the main computer systems of about a dozen ARPA-funded universities and research institutions.
- By the end of 1969, four computers (located at UCLA, Stanford Research Institute, University of California Santa Barbara, and the University of Utah) were connected.



- Computers were added quickly to the ARPANET during the following years.
- In 1972, first electronic mail sent on ARPANET, it soon became an extremely popular application for those who had ARPANET access.
- As time went on, other networks, such as the National Science Foundation's NSFnet, were created and connected with the ARPANET. Internet formed gradually.
- Use of this interconnected network, or Internet, was originally limited to government, research, and educational purposes.
- Even with this restriction, by 1989 there were over 100,000 hosts on the internet.
- The ban on commercial use was lifted in 1991, and by the end of 1992 there were over 1 million hosts connected.



- Hobbes's Internet Timeline reports that as of 2005, there were over 353 million host computers on the internet.
- A brief history of the Internet written by the people who created it can be found at <http://www.isoc.org/internet/history/brief.shtml>.
- One of the important reasons for such an explosive growth of internet is TCP/IP Protocol; TCP/IP enables different networks (with different computers and different operating systems) to connect and communicate.



TCP/IP (Transmission Control Protocol/ Internet Protocol)

- In 1974, TCP/IP with IPv4 designed by Bob Kahn (BBN) and Vint Cerf (Stanford).
- In 1983, ARPANET started to use TCP/IP Protocol.
- TCP/IP has been adopted as the official communication protocol of the internet.



TCP/IP Layers

TCP/IP Protocols

Application Layer	HTTP	FTP	Telnet	SMTP	DNS
Transport Layer	TCP		UDP		
Network Layer	IP	ARP	ICMP	IGMP	
Network Interface Layer	Ethernet	Token Ring		Other Link-Layer Protocols	



World Wide Web

- Another important reason for such an explosive growth of internet is web technology. Web made the information on the internet much easier to access.
- Tim Berners-Lee invented World Wide Web in 1989 when working as a researcher at CERN, the European Particle Physics Laboratory in Geneva, Switzerland.
- In 1989, he began to develop a technology for sharing information via hyperlinked text documents, through which scientists could easily “hyperlink” to another research paper and immediately view it.



- He proposed the basic elements of web including:
 - Client – he created the first client browser “WorldWideWeb”, it was a web editor as well.
 - Server—he created the first web server “httpd”.
 - URL—Uniform Resource Locator
 - HTTP—Hypertext Transfer Protocol
 - HTML—HyperText Markup Language
- In 1991, he posted the source code on internet; more and more people were attracted to web technology.
- In 1993, the first graphics-based web browser, Mosaic, became available, which made the information on the internet much easier to access.
- In October 1994, Tim Berners-Lee founded an organization- the World Wide Web Consortium (W3C) to take responsibility for developing the various protocols and standards associated with the web.



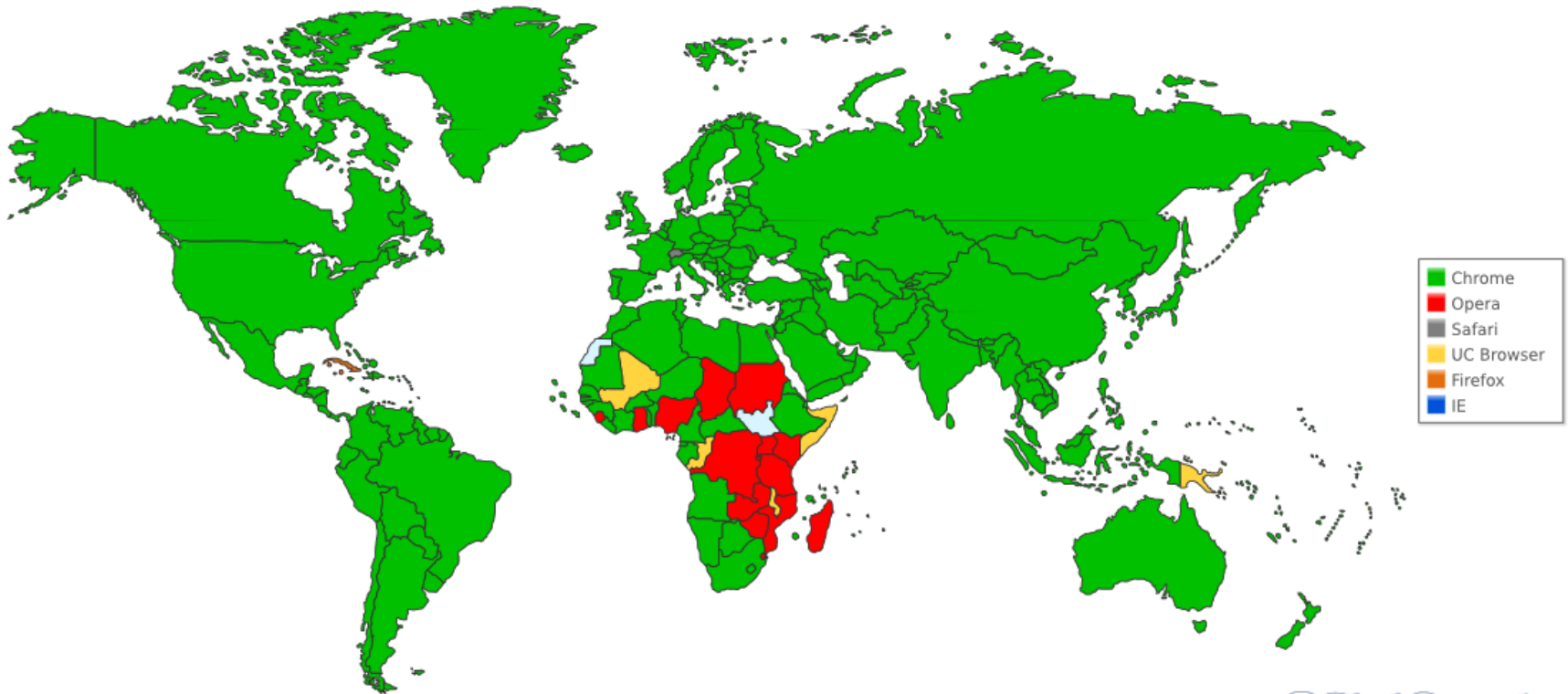
Web Basics (Basic Elements of Web)

- Web Client

- A web client is software that accesses a web server by sending an HTTP request message and processing the resulting HTTP response.
- Web browsers running on desktop or laptop computers are the most common form of web client software. (But there are many other forms of client software.)
- Next slide shows the most used web browsers by country as in July 2017



StatCounter Global Stats
Browser Market Share Worldwide, July 2017



source : StatCounter Global Stats - <http://gs.statcounter.com/browser-market-share#monthly-200901-201707>



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- Web Server

- A web server is a computer program that delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol (HTTP), over the World Wide Web.
- The primary function of a web server is to accept HTTP requests from web clients and return an appropriate resource (if available) in the HTTP response.
- Next slide shows the latest statistics of the market share of the top web servers on the internet by Netcraft Survey, February 2017



Product	Vendor	Feb 2017	Percent
IIS	Microsoft	773,552,454	43.16%
Apache	Apache	374,297,080	20.89%
nginx	NGINX, Inc.	348,025,788	19.42%
GWS	Google	18,438,702	1.03%

Market share of the top web servers

source : <https://news.netcraft.com/archives/2017/02/27/february-2017-web-server-survey.html>



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URL

- URL stands for Uniform Resource Locator.
- A URL is a formatted text string used by Web browsers, email clients and other software to identify a network resource on the Internet.
- If you know the URL of a publicly available resource anywhere on the web, you can enter that URL into a web browser's address field and the browser can access that resource.



Domain Name System (DNS)

- DNS is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network.
- A domain name consists of one or more parts, technically called labels, which are conventionally concatenated, and delimited by dots, such as example.com.
- The right-most label conveys the top-level domain; for example, the domain name www.example.com belongs to the top-level domain com.



Conclusion of The Chapter

- This chapter introduced the World Wide Web and the Internet. In the next chapter, we will learn to create a basic web page using HTML.



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Activities

- Please refer to Tutorial 1



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