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# Basic Computing and Programming

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Lecture # 10:

Introduction to Internet

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# Today's Aim

- What is Internet?
- Key Characteristics
- Components of the Internet
- Internet Addressing – the Domain Names
- DNS
- Tools and Services on the Internet
- Statistics
- History of Internet

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# What is Internet?

- A network of networks
- Connects computers around the Globe
- Not owned by any Organization or a person
- Thousands of users connect to and disconnect from it daily
- For students; a great resource for research activities

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# Key Characteristics

- Geographic Distribution
- Worldwide Acceptance
- Continued Exponential Growth
- Robust Architecture
- Speed
- Universal Access
- Standardized flow of Info
- Self-Learning Made Easy
- Freedom of Speech
- The Digital Advantage-Packet Switching

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# Components of the Internet

- The key components of the Internet are:
  - Clients
  - Servers
  - Protocols

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# Components of the Internet

## ■ Clients

- The users (or computers) connected to the Internet are called clients
- The software running on the user-end are called Client-Software
- Examples:
  - Browsers
  - Messengers
  - FTP software

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# Components of the Internet

## ■ Servers

- ❑ The machines dedicated to providing different services to the users/clients are called Servers
- ❑ For example, File Servers, Web Servers, Game Servers, Streaming Servers etc.
- ❑ Servers run special software to serve the clients, e.g., Apache, PHP, MySQL etc.

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# Components of the Internet

## ■ Protocols

- A standard set of rules for communication over the Internet
- Examples:
  - HTTP (hyper-text-transfer protocol)
  - FTP (file-transfer protocol)
  - SMTP (simple-mail-transfer protocol)
  - POP3 (post-office-protocol)



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# Components of the Internet

- Protocols (continued)
  - HTTP
    - used while retrieving a web page from a web-server
  - FTP
    - involved in downloading a file from a file-server
  - SMTP
    - used to send e-mail
  - POP3
    - used for receiving e-mail

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# Components of the Internet

- Protocols (continued)
  - TCP/IP
    - The protocols' suit of choice for use over the Internet
    - Developed by DoD on Unix (1980s)
    - TCP responsible for forming the packets
    - IP responsible for Routing
    - TCP responsible for Reassembly at the destination

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# Internet Addressing

- Recall the Global IP addresses; used to identify a machine worldwide
- But IP address being a number can't be remembered easily
- So every Global IP address is mapped to a 'Domain Name', easily remembered
- Examples of Domain Names;  
[www.google.com](http://www.google.com), [www.wikipedia.org](http://www.wikipedia.org)

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# DNS

- DNS (Domain Name System)
  - It is the system which enables to find out the IP address; given a Domain Name
  - Domain Name Servers are the key components of this system
  - These servers run databases containing the names and IPs of machines on the Internet
  - These name servers also exchange messages to update one another

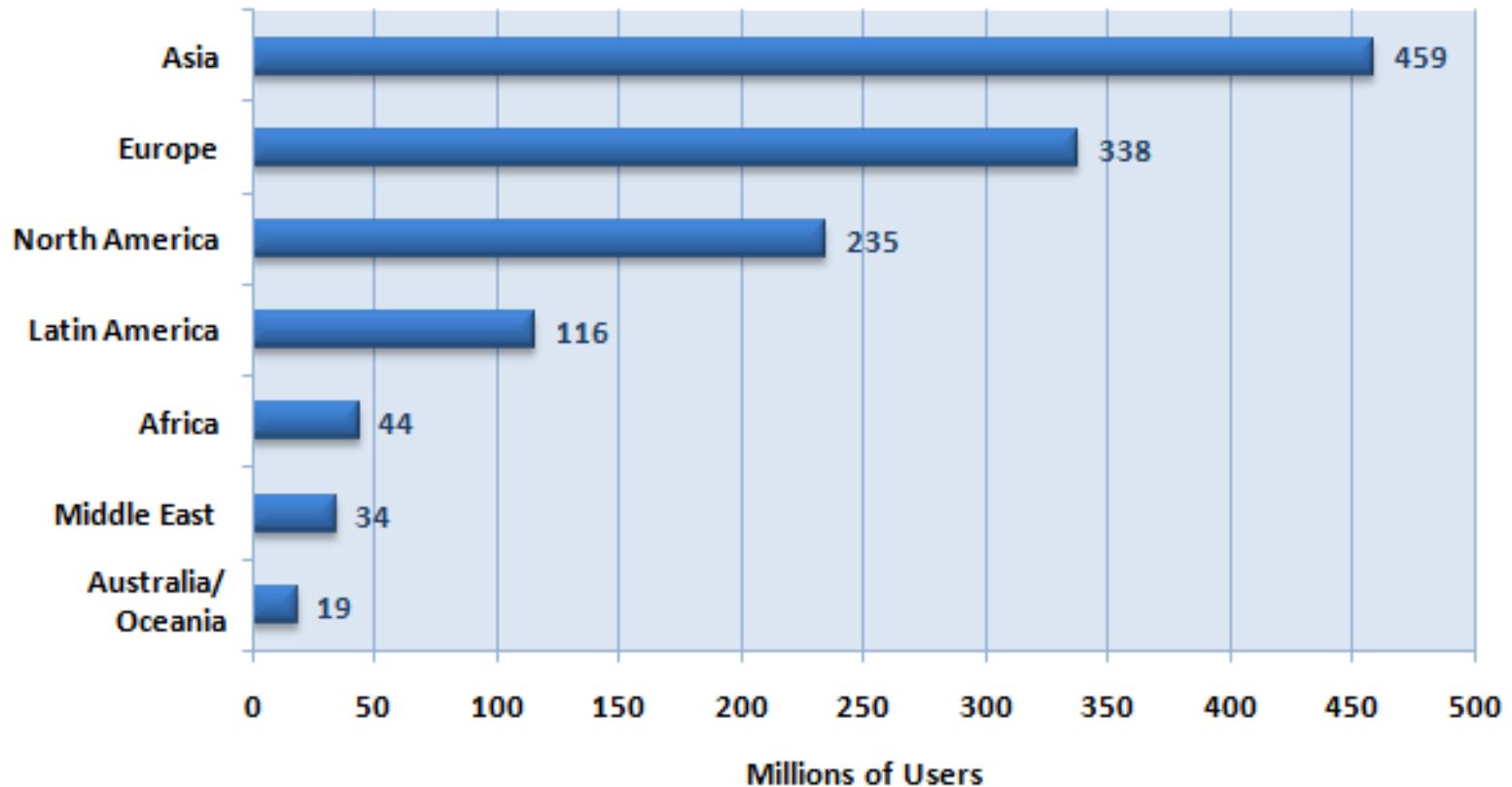
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# Tools and Services on Internet

- e-Mail
- Instant Messaging-Chat
- Remote Login
- File Transfer
- Newsgroups
- Games
- WWW

# Internet Users Worldwide

## Internet Usage by World Region



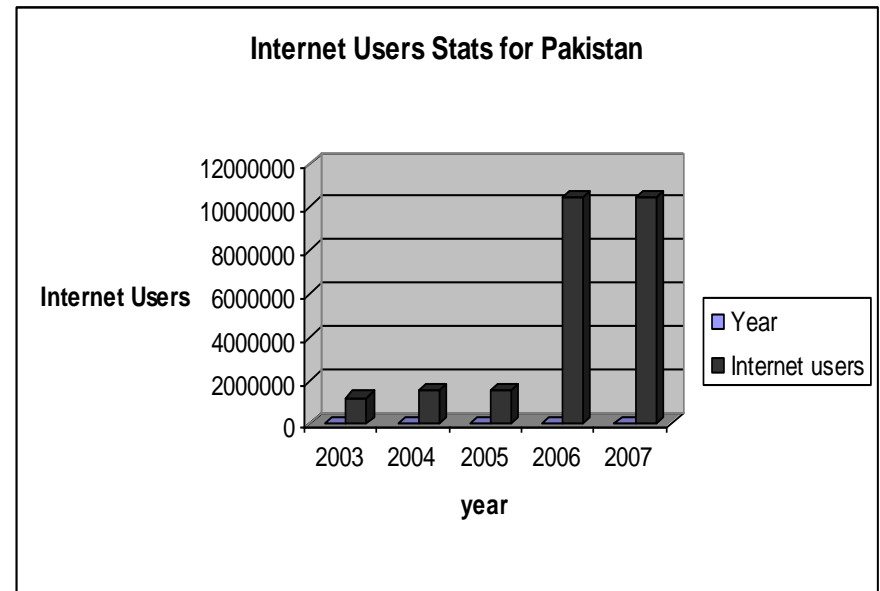
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# Users Statistics (continued)

WORLD INTERNET USAGE AND POPULATION STATISTICS						
World Regions	Population ( 2007 Est.)	Population % of World	Internet Usage, Latest Data	% Population ( Penetration )	Usage % of World	Usage Growth 2000-2007
<u>Africa</u>	933,448,292	14.20%	<b>43,995,700</b>	4.70%	3.50%	874.60%
<u>Asia</u>	3,712,527,624	56.50%	<b>459,476,825</b>	12.40%	36.90%	302.00%
<u>Europe</u>	809,624,686	12.30%	<b>337,878,613</b>	41.70%	27.20%	221.50%
<u>Middle East</u>	193,452,727	2.90%	<b>33,510,500</b>	17.30%	2.70%	920.20%
<u>North America</u>	334,538,018	5.10%	<b>234,788,864</b>	70.20%	18.90%	117.20%
<u>Latin America/Caribbean</u>	556,606,627	8.50%	<b>115,759,709</b>	20.80%	9.30%	540.70%
<u>Oceania / Australia</u>	34,468,443	0.50%	<b>19,039,390</b>	55.20%	1.50%	149.90%
<b>WORLD TOTAL</b>	6,574,666,417	100.00%	<b>1,244,449,601</b>	18.90%	100.00%	244.70%

# Pakistan's Statistics

- 1.2M Internet users in Pakistan in 5/2000 (1% of population)
- 10.5 M (2005)
- 12 M - 9/2006 (7.2% of total Population)





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# History

- 1858-The Atlantic Cable
- 1957-Sputnik
- 1958-DoD establishes ARPA
- 1962-Licklider Involves 4 Universities
- 1969-BBN's IMP
- 1972-ARPANET's Public Debut

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# History

- 1972-email and @ symbol, Telnet Protocol
- 1973-FTP
- 1974-"Internet" used for the first time
- 1978-UUCP
- 1979-Usenet
- 1980-DoD Replaces NCP by TCP/IP
- 1981-BITNET for IBM
- Listserve

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# History

- 1983-TCP/IP becomes Universal
- 1986-NSFNet, a 56Kbps connection
- 1989-56Kbps upgraded to 1.5Mbps T1 connection
- 1989-Archie
- WAIS
- 1990-ARPANET dissolved
- 1991-Gopher came into Being

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# History

- 1993-WWW
- 1993-NSFNet upgraded to T3 (45Mbps)
- 1993-1994 - Web browsers Mosaic & Netscape Navigator are introduced
- 1995-NSFNet6 replaced by vBNS

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- Internet vs WWW?

- Internet vs Intranet?