

Chapter 1: internet and the world wide web

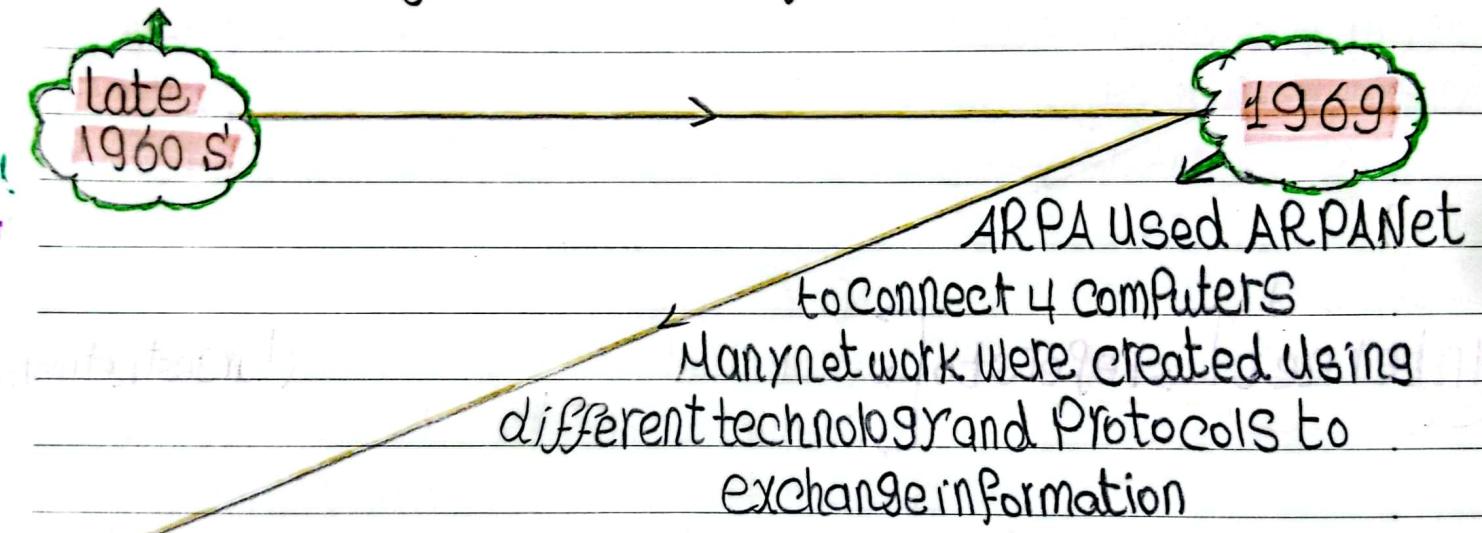
• Evolution of internet

pre-internet: computer are used for computing

with the internet: challenges shifted to communication, with vast information available in various formats (text, image...)

• Concept of the internet

DRRPA explored communication ways for computer networks to coordinate nuclear weapons, resist attacks and remain functional even if it was down



1969

ARPA used ARPANet to connect 4 computers. Many networks were created using different technology and protocols to exchange information.

1989

A number of protocols were combined to form ARPANET protocol which was adapted to create TCP/IP

1993

all computers that are connected to networks have been used TCP/IP model

الاتصالات الالكترونية | packet switching

source to destination

الموضوع

التاريخ

Packet switching

VS

Circuit switching

- A direct physical connection is established between the sender and receiver before transmission.
- Data is transmitted only through the reserved channel for this connection.
- Other devices cannot use the channel until the connection is terminated.

لذا يكون فيه اتمام تابت الي الطرفين
في الفون او الرؤبي مما يقدر بالرسوخ
الخط يعني لاما ذكر

- Data is divided into small units called packets before transmission.
- Packets can take different paths to reach the destination. Routers determine the shortest path and transmit packets.

البيانات بتتلقى في مسيرة و كل حزمة
باتجاه طريق مختلف، و بتتلقى السرعة وكفاءة
مدعى ما كان اخراج لخط ثابت. زي الانترنت

Internet

refers to a group of networks that are connected to each other

global network of networks (largest network)
products, concepts, technology used to develop the connection among disparate networks

أهم معلومات بتتطور السرعة

في الانترنت

World-wide web

لـ هوائي في الانترنت اساع المدى ويعتمد على

بروتوكول TCP/IP لنقل البيانات

Multimedia streaming (real-time, on-demand audio/video to the home)

الذى يدور الشوف فيديو / تسمع اذاعة في المدى

Wireless networks (freedom from physical constraints of wires)

(anything, anytime, anywhere)

بـ اي اجهزة، اي اذاعة، اي اى مكان

internet services

- World wide web (www)
- video conferencing
- file transfer protocol (FTP)
- TELNET
- Email
- internet Relay chat (IRC)

الإنترنت مملوكة لجهة واحدة لكنه مدار مفتوحة
منظماً لكل منها دور في تشغيله وتطويره

التاريخ:

الموضوع:

Who governs the internet?

No corporation owns or operate all networks

No governing body of the internet

Volunteer Groups as \Rightarrow (ISOC): to provide leadership in internet-related standards, education, access and policy

(W3C): Responsible for drafting, circulating for review and modifying Web standards

(InterNIC): Responsible for domain registration

Domain Name System "DNS" are essential in connecting Internet Protocol Address "IP" \Rightarrow computers and assigning space on internet

United States Government \rightarrow maintains ultimate control of the DNS root system but handed daily DNS administration to other entities

ICANN \rightarrow manages the root nameserver, IP address allocation, DNS management, and protocol parameter assignment

IETF \rightarrow open community of engineers, vendors, operators, researchers developing internet standards and overseeing TCP/IP protocol evolution

ITU \rightarrow developing international communication standards

العنوان الذي ينجزه في الميزة وبياناته على الانترنت هو محدود
العنوان كدالة في منظمات مسؤولة عن توزيع العنوانين وتنظيمها

التاريخ:

الموضوع:

Who manages IP address?

- IP address must be unique
- Address Space on the internet is limited

IANA

IANA

Responsible for

- IP address Management
- The global coordination of the DNS root
- Internet Protocol resources
- IP addressing

• In Dec 1997, IANA turned this responsibility over to

ARIN

APNIC

RIPENCC

AFRINIC

- Responsible for internet registers
- In Canada, many
- Caribbean, North Atlantic islands and United States

• Manages the assignment of Internet number source within the Asian region

• Who Controls the internet today?

No single organization governs the internet
Managed by volunteer-based groups with limited authority

IAB

Inter NIC

W3C

- Comprised of IETF and IRTF
- Technical body that supervises the development of the internet suite of protocols

• Provides registry services needed for the internet to operate effectively

• Responsible for drafting, circulating, for review and modifying web standards

- Extranet \rightarrow عامل زي جروب والشباب للعيلات خاص بافرادها بس مصدر برا العيلات يقدر المسوون
- Extranet \rightarrow هو زي جروب العيلات بس فيه اجيال العقول فيه هنلا مني اي مد يقدر يرضي بس العيلات للمنت لبعض الاشخاص مد برا يكونوا معاهم التاريخ: الموضوع:

Intranet and Extranet

Advantages of intranet

- Easy access of company data to employees
 - Communication between employees in large organization is improved

Application of intranet

- Sharing of company policies, rules
 - Access employee database
 - Access Product, customer data
 - Submission of reports
 - Sharing of information of common interest

- A Private version of the internet which have the same architecture as in internet
 - An internal network (not available to the world outside of internet)
 - USEs TCP/IP
 - found in corporations for secure sharing of organization's information
 - Resides behind a ~~firewall~~ that control access between internet + intranet
Permits access only to members of the same organization

- An intranet for outside authorized users using the same internet technology

Extranet

- The actual server (Pc) resides behind a firewall
 - Considered a large organizational information System

Access controlled via

- Username and Password
 - IP address (a unique set of numbers as 209.33.21.117 That defines the computer

ISP هي الشركة التي بتوصيات بالإنترنت

- الاتصال بالإنترنت عبر بروتوكول PPP Protocol (العنصر وبأوامر)
- الدخول إلى الإنترنت بـ DSL (Digital Subscriber Line) أو wireless (ويكي ويونات الفون)

الموضوع:

Internet Service Provider (ISP)

A company that provides access to the internet for user and business
So Internet access provider (IAP) ISP (الاتصالات بالإنترنت)

* (when talking about independent service provider)

* ISP examples

↳ (Vodafone - Etisalat - orange)

* Large ISPs: own high-speed leased lines, reducing their reliance on telecom providers and offering better service

* How does ISP connect you to the internet?

Communication between the user and ISP happens through the PPP (Point-to-Point Protocol)

↳ allows the user's device to connect to the ISP even without an IP address

* Steps in connection between (ISP and user)

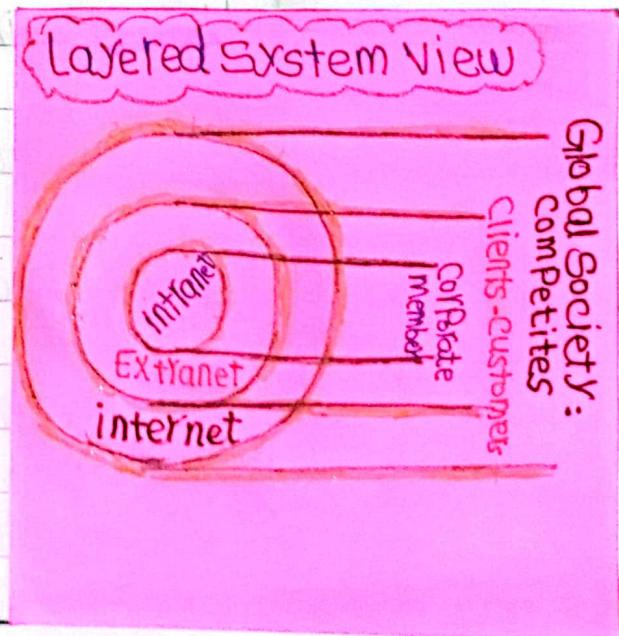
- A telephone call
- initialization of communication
- Verification of the Username (login or user ID) and Password

Internet access: Connects terminals, computers, mobile devices and computer networks to internet enabling user to access internet service

The main new access technologies

↳ Digital Subscriber Line (DSL)

↳ wireless internet access



Digital subscriber line (DSL)

group of technologies that provide high-speed internet using ordinary telephone lines

"The main Types of DSL"

ADSL (Asymmetric DSL)

- Most common type of DSL
- Asymmetric: Download Speed is faster than Upload Speed
- Download Speed: 256 kbit/s to 20 mbit/s depending on technology and condition
- Uses standard phone lines
- Can use phone while browsing the web
- Always on Service (no need to reconnect)

*ADSL Requirements

ADSL Splitter: Separates phone traffic from data traffic

ADSL Modem: Converts digital signals from a PC into analog signals for transmission

Local Loop: The path from customer's house to the local exchange

Service Provider

The cable consists of a "Copper Pair"

للحوك إلكترونيات الاتصالات

لتحل محل الفايبر

VDSL (Very-high-data-rate DSL)

- Approved in 2001
- Higher speeds than ADSL
- Provides data rates up to 52 Mbit/s (downstream) and 16 Mbit/s (upstream) over copper wires
- Up to 85 Mbit/s (down, up) over coaxial cable
- Supports applications like HDTV, VoIP (Voice over IP) and high-speed internet

overable connection

Wireless internet Access (WISP)

Wireless internet Service Providers (WISP) offer internet without cables using various wireless technologies.

* Wi-Fi * WiMax * Cellular Network * Satellite Technology

Provides access for mobile devices like laptops, handheld computers and phones in airports, Cafés, conference rooms, etc.

Types of wireless internet access

* Fixed wireless (including satellite access)

* Mobile internet access (WAP)

Advantages of using the internet

- Seamless communication: connects networks regardless of different technologies
- Reliable and fixed: solves issues in reliability, connectivity and network management
- Efficient data transmission: works across networks with different speeds
- Instant information: allows latest news and online reference
- Social connectivity: helps in staying connected via social media
- E-commerce online service: supports businesses and digital transactions
- Marketing & Promotion: enhances product and service visibility
- Customer engagement: collects feedback and suggestions for improvement

Disadvantages of using the internet

- Information overload
- There is a lot of wrong information on the internet
- Some viruses can get into the PC's and destroy valuable data
- Hackers can use internet for identity theft

الإنترنت: الشبكة التي تنقل البيانات بين الأجهزة
الويب: هو جزء من إنترنت يستخدم لعرض صفحات وربطها
WWW: يطلب تحميل لصفحات مختلفة من قبل المتصفح صفحات مكتوبة بـ ال التاريخ ومرتبطة hyperlinks الموضوع

The world wide Web: is a distributed Client-Server service where a browser retrieves web pages from servers, linked via hyperlinks and created with HTML

They are separate entities, but also welded together

internet Vs Web (What is the difference)?

internet: consists of hardware and software protocols enabling communication across networks

Web: is a software system on the internet that uses hypertext protocol to link documents

* **Accessing the web:** requires internet and web browser

Web Generation

Web 1.0

(Read-only era, before 1999)

- Focused on building web, marking it accessible, and commercializing it
- Users could only view content but couldn't contribute, included social networking sites
- Email was sent through the HTML form
- Information was static, non dynamic and could only be updated by the web master
- Relied on protocols like HTTP and markup languages like HTML and XML
- Key features: hyperlinks and bookmarking, ebay

Web 2.0

(2004) collaborative web

- Second generation of internet based service
- Popularized by Timo Reilly
- Twitter, facebook, blogs, wikis
- Communication Tools and Video Streaming
- Emphasized user collaboration and content sharing
- Mobile internet and mobile devices (Cameras, phones...)

الويب 2.0 يعتمد على تفاعلات عامة

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Played a key role in growth

وأدى إلى انتشار

ظهور مئات المواقع الجديدة

في جميع أنحاء العالم

في الآونة الأخيرة

الإنترنت: الشبكة التي تنقل البيانات بين الأجهزة
الويب: هو جزء من إنترنت يستخدم لعرض صفحات وربطها
WWW: يطلب توصيل لمصففات مختلفة موجودة داخل المتصفح صفحات مكتوبة بـ ال التاريخ ومرتبطة hyperlinks الموضوع

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الويب في البداية #

الويب يتطور إلى #

web 1.0 #

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Played a key role in growth

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ظهور مئات المواقع الجديدة

في جميع أنحاء العالم

Web 3.0 (2006, intelligent web)

- coined by John Markoff of The New York Times
- introduced semantic web, microformats, natural language search, data mining, machine learning, recommendation agents and AI
- Aimed at machine-facilitated understanding to provide more productive web browser: (web client)
- retrieves information from the web and displays web pages
- Examples: Microsoft Internet Explorer, Firefox, Opera...)

Web Server: Can be either hardware

(The computer), software (an application that responds to browser requests).

Main use: Hosting websites

Other uses: online gaming, data store or running enterprise

1. Serving web pages

2. Controlling access to the server

3. Monitoring and logging all access

4. Running gateway programs CGI and returning output

The most popular web browser

Chrome	58.2%
Safari	17.7%
Firefox	11.1%
Internet	7.1%
Explorer + Edge	5.5%
Firefox	5.5%
Opera	2.6%

* هو بروتوكول للاتصال

Popular web server

* Apache HTTP Server

* Microsoft IIS (Internet Information Services)

الوب يوفر بخلاف الواقع سلوك وينتهي
وبينهم بالطبع وليس كل الدفع والدفع

ـ تحدى هيكل المصفحة HTML و XHTML
ـ تسيق شكل المصفحة CSS
ـ إضافة المفاعليات والديناميكية JS
ـ تحويل و تبادل البيانات به XML
ـ الموضع التاريخ

Web Programming languages

- web Programming uses Scripting language which include in static technologies like: HTML, CSS, JS, XML
- server-side languages handle most web development
- The code runs on the server, processes data, and sends static content to the browser

HTML

(HyperText Markup Languages)

- Not a programming language as it cannot describe computations
- Defines the general form and layout of a document, including Paragraphs, blocks, lists, images, tables, focus and comments
- displayed by the browser

XML

(Extensible Markup Languages)

JavaScript

- Standard way to store and interchange information among internet connected devices
- A meta-markup language that specifies rules for creating markup languages
- Browsers use XML parser to isolate and extract information from XML documents
- tells the browser how to change the web page in response to events that happen like clicking on something or changing the value in a form input

XHTML

(Extensible HyperText Markup Languages)

- A reformulation of HTML 4 in XML 1.0
- consists of all HTML 4.01 predefined components combined with XML standards
- Aims for making XML documents that look and act like HTML documents
- using XHTML helps strengthen the structure and syntax of your markup

يكتب كود PHP (أوائل لغة برمجية) جوهر صفحة HTML المعروف بـ القراءة سطر لسطر وينفذ الكود (في المثال هو يطبع) ويرد لها نتائج الصفحة المنشورة ويعرضها بشكل انتاريخ عادي بـ التاريخ

التاريخ:

likethis

الموضوع:

How does Website programming work?

- You will embed code within your html Pages
 - When you access your Pages with a browser the web server will read the html Pages line by line
 - Because of it comes with a programming language it executes the code and write the current data on the page and then sends the page back to the web browser
 - The web browser see a normal web page with a data

The Server (Back-end)

- Responsible for serving Pages to clients
 - Runs Server side Programming to generate dynamic content
 - interacts with Permanent storage (SQL, files)
 - processes user input → structures web app

Uses: ASP, JSP, Python, IS API / NS API

Requires knowledge of: HTML, SQL, Linux / Unix Shell Scripting

الرسائل في الكواليس على المسير (رسول عن تحزيم البيانات) تلخيص العلاقات التفاعلية dataflow

The user

- ↳ Uses the client (browser) to access web content
 - ↳ Surfs the web, watches videos, interacts with app

```
<html>
  <head>
    <title>MYwebPage</title>
  </head>
  <body>
    <? Php
      printdata("y/m/d");
      ↑ فانكشن التاريخ
      بحسب التاریخ
    ?>
  </body>
</html>
```

The client (Front-end)

- Requests Pages from the server and display them
 - Uses `<Script>` elements and executes in the browser
 - Provides immediate feedback to us
 - Reduces Server Load & minimizes network traffic
 - Sends & receives data from Server

USES: JScript, JVBScript

Requires knowledge of:
CSS, Ajax, HTML, UI design

المسؤول عن انجاز اليات عمل معا

* الوجه الحال بيان المتصفح يطلب صفتة منه اليرف، اليرف يسيّرها من الملفات
أى عنده ويبيّنها للمتصفح يعرفها للمتصفح

التاريخ:

الموضوع:

How does the web work?

- * The web information is stored in the web pages in HTML format
- * The web pages are stored in web server file system
- * The web client with specific web browser reads the pages
- * The web server waits for the request from the web client over the internet (IIS, Apache)

كل جهاز على الانترنت له رقم معيّن (IP) وأي طلب
يُدخل إلى سيرفر المتصفح يعود بـ URL

Finding information on the web

- **internet Protocol address (IP):** every device connected to the internet have a unique network identifier
- **uniform resource locator (URL):** is a unique address for a file that is accessible on the internet used for specifying internet resources (Web Pages, email address)

URL

URL strings consist of three parts: * network protocol

* Hostname or address * file or resource location (Path)

Protocol://host/location

is the Client/Server program comes from standard is the location of used to retrieve the document internet databases like this web pages including DNS and can be names Two subdirectories

HTTP://www.w3schools.com/or IP address and the filename

http://www.w3schools.com/ موقع أو عنوان؟ أي نوع المتصفح يدخل

file:// نقل الملفات

mailto:// بريد الإلكتروني

→ Different Domains on the WWW

.com : commercial .net : network

.edu : educational .org : organization

.gov : government

- DARPA (Defense Advanced Research Projects Agency)
- WWW (World Wide Web) • FTP (File transfer Protocol)
- IRC (Internet Relay Chat)
- ISOC (Internet Society Professional Membership Society)
- INTERNIC (Internet Network Information Center)
- DNS (Domain Name System)
- IP (Internet Protocol Address)
- ICANN (Internet Corporation for Assigned Names and Numbers)
- IETF (Internet Engineering Task Force)
- ITU (International Telecommunication Union)
- IANA (Internet Assigned Numbers Authority)
- ARIN (American Registry for Internet Numbers)
- APNIC (Asia-Pacific Network Information Center)
- RIPE NCC (Réseaux IP Européens Network Coordination Center)
- AFRINIC (Africa Network Information Center)
- IAB (Internet Activities Board)
- W3C (World Wide Web)
- IAP (Internet Access Providers)
- ISP (Internet Server Provider)
- PPP (Point to Point Protocol)
- URL (Uniform Resource Locator)
- IIS (Internet Information Service)
- DSL (Digital Subscriber Line)
- ADSL (Asymmetric Digital Subscriber Line)
- VDSL (Very-high data rate ↓ ↓ ↓)
- WISP (Wireless Internet Service Provider)