جامـعة محمد الصديق بن يحي - جيـــجل –

COMPUTER NETWORKS

الشبكات

Bfs Khalil

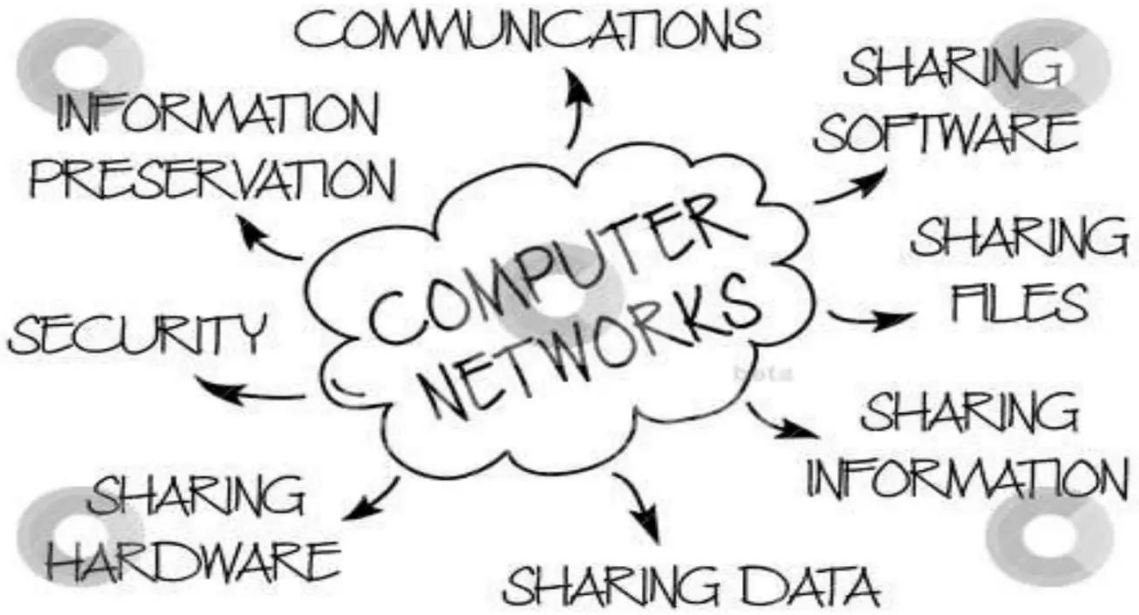
تعريف الشبكات
Networks

A computer network is a means of communication allowing individuals or groups (companies) to share information. It is a set of equipment and tools (hardware and software) allowing resources and services to be shared

شبكة الاعلام الالي هي وسيلة الاتصال التي تسمح للأفراد أو المجموعات (الشركات) بتبادل المعلومات وهي مجموعة المعدات والأدوات (الأجهزة والبرامج) التي تسمح بتبادل الموارد والخدمات

فوائد شبكة الاعلام الالي

Advantages of Computer Networks



فوائد شبكة الاعلام الالي
Advantages of Computer Networks

- Sharing of material resources: printer, CD-ROM, modem, hard disk, etc.
- Communication between people: email, online chat, etc.
- Sharing documents: files, folders, images, etc.
- Application sharing: data base, …

المشاركة في الموارد والعتاد: المشاركة في الطابعة (imprimante)، القرص المضغوط (CD-ROM)، القرص الصلب (Disque dur)، المحول (Modem)، ....

الاتصال بين مستخدمي الشبكة: البريد الالكتروني (Courrier éléctronique)، المحادثة اللحظية (Discussion instantanée)

مشاركة الملفات: مجلدات، ملفات، صور، ...

مشاركة التطبيقات: قواعد البيانات، ...

بنية الشبكات
Networks Architectures

All networks are based on one of the following architectures:

تستند جميع الشبكات على احد الأنواع التالية

- Peer to Peer (P2P) networks بنية الند للند

A peer-to-peer network is a simple network of computers. It first came into existence in the late 1970s, Here each computer acts as a node for file sharing within the formed network. each node acts as a server and thus there is no central server in the network. This allows the sharing of a huge amount of data.

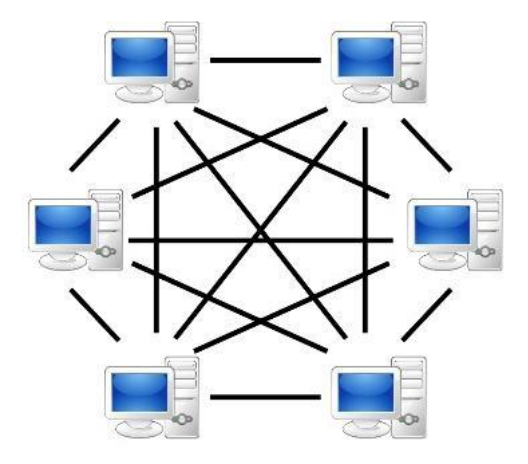
In its simplest form, a peer-to-peer (P2P) network is created when two or more PCs are connected and share resources without going through a separate server computer

بنية الشبكات
Networks Architectures

- Peer to Peer (P2P) networks بنية الند للند

In P2P (Peer-to-Peer) Architecture, there is not any concept of a Central Server. Each device is free for working as either client or server.

تتكون شبكة الند للند P2P من مجموعة من الأجهزة التي تقوم بتخزين ومشاركة الملفات بشكل جماعي. يعمل كل مشارك (عقدة) كند فردي. عادةً ما تقوم العقد بنفس المهام.



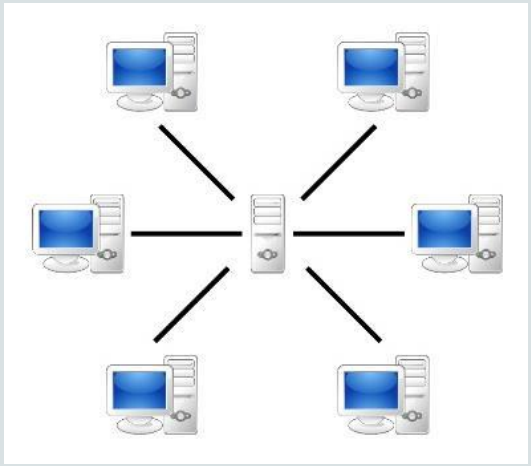
بنية الشبكات
Networks Architectures

- **Client/Server networks بنية الخادم / العميل**

is a type of Computer Network Architecture in which Nodes can be Servers or Clients. Here, the server node can manage the Client Node Behaviour.

Client: is a computer (Host) i.e. capable of receiving information or using a particular service from the service providers (Servers).
Servers: is a remote computer which provides information (data) or access to particular services

في هذه البنية نجد حاسوب مركزي يقدم خدمات للحواسيب العميلة مثل شبكة الانترنت



أنواع الشبكات
types of computer networks

The Network allows computers to connect and communicate with different computers via any medium. LAN, MAN, and WAN are the three major types of networks designed to operate over the area they cover. There are some similarities and dissimilarities between them. One of the major differences is the geographical area they cover, i.e. LAN covers the smallest area, MAN covers an area larger than LAN and WAN comprises the largest of all.

There are other types of Computer Networks also, like :

PAN (Personal Area Network) الشبكة الشخصية

SAN (Storage Area Network) شبكات التخزين

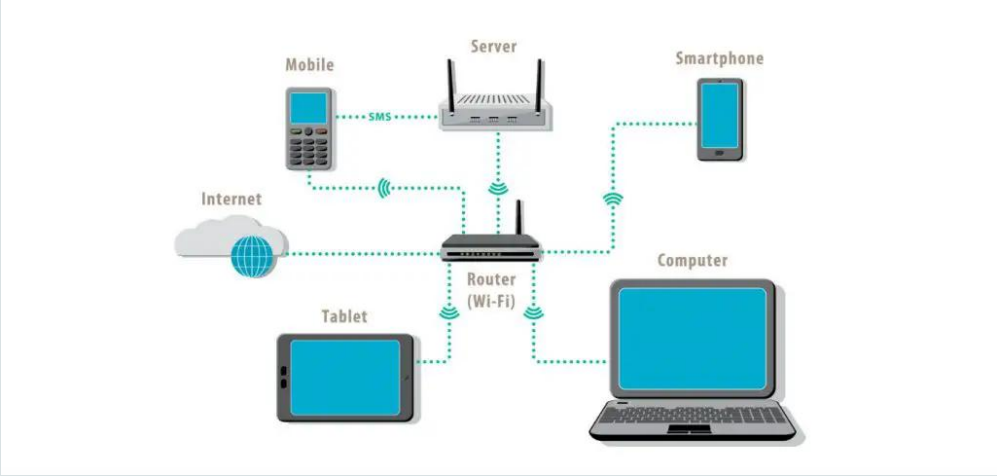
EPN (Enterprise Private Network) لشبكات الخاصة بالمؤسسات

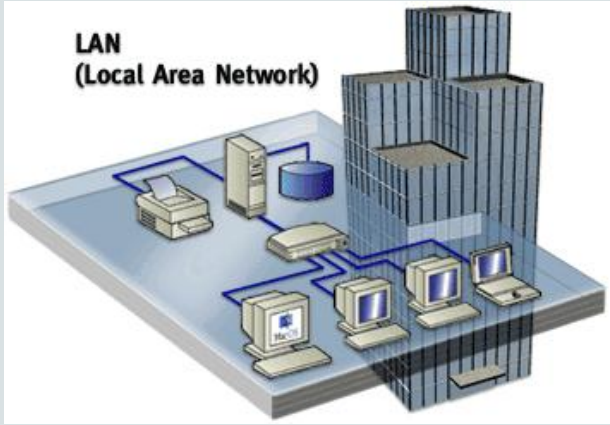
VPN (Virtual Private Network)الشبكات الافتراضية الخاصة

أنواع الشبكات
types of computer networks

Local Area Network or **LAN** الشبكة المحلية

LAN: Local Area Network (LAN) is a network that covers a small area, such as an office or a home. LANs are typically used to connect computers and other devices within a building or a campus. Communication in a LAN is usually done via Ethernet (wired) or WiFi (wireless)

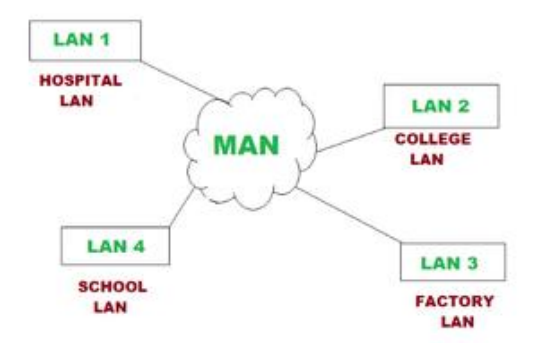




أنواع الشبكات
types of computer networks

Metropolitan area Network or **MAN** الشبكات الإقليمية

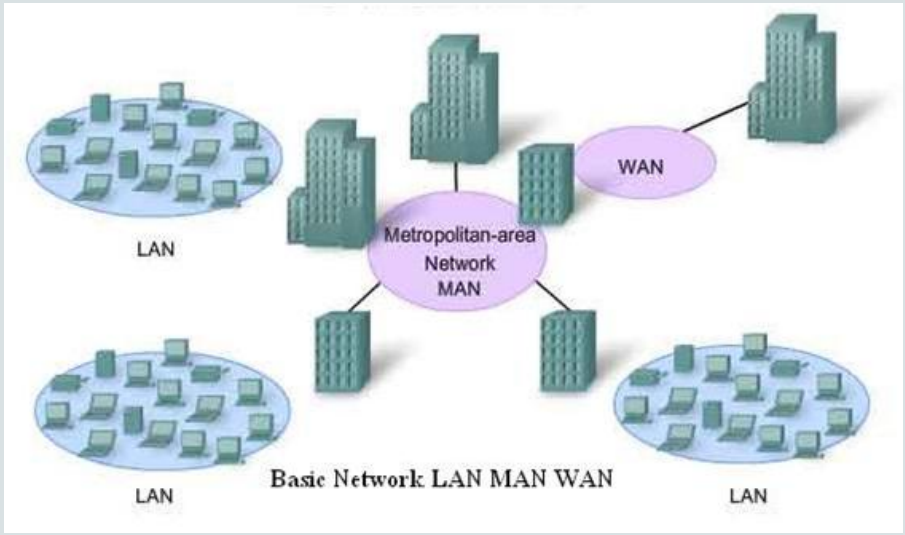
MAN or Metropolitan area Network covers a larger area than that covered by a LAN and a smaller area as compared to WAN. MAN has a range of 5-50km. It connects two or more computers that are apart but reside in the same or different cities. It covers a large geographical area and may serve as an ISP (Internet Service Provider). MAN is designed for customers who need high-speed connectivity. Speeds of MAN range in terms of Mbps. It's hard to design and maintain a Metropolitan Area Network.

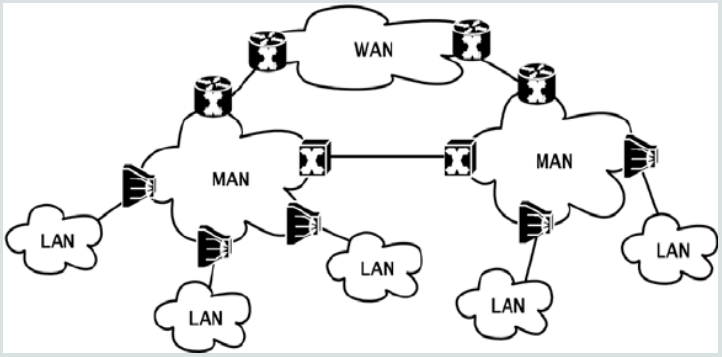


أنواع الشبكات
types of computer networks

Wide Area Network or **WAN** الشبكة واسعة النطاق

WAN: A Wide Area Network (WAN) is a network that covers a large geographic area, such as a city, country, or even the entire world. WANs are used to connect LANs together and are typically used for long-distance communication.





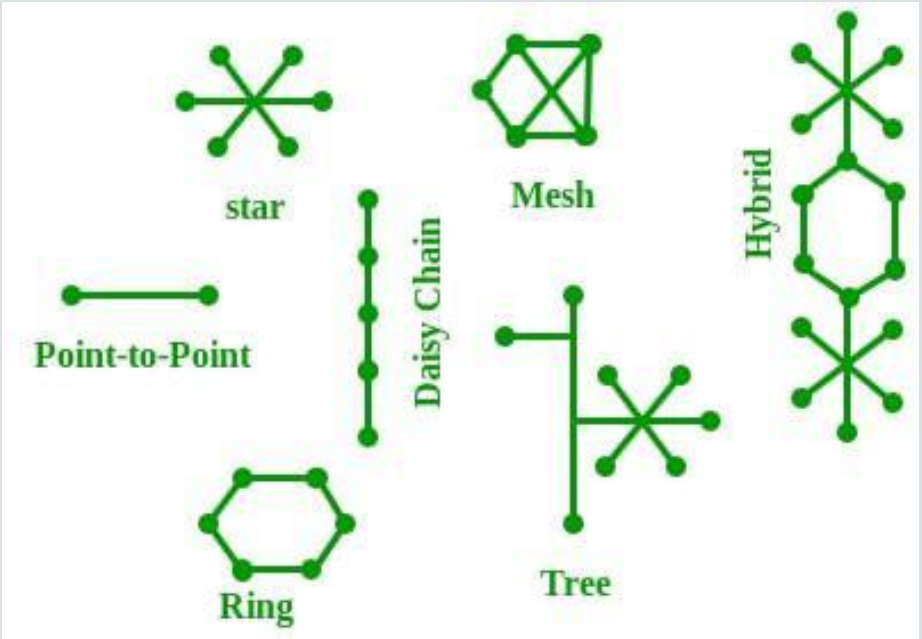
المعدات اللازمة في شبكة محلية
Networks Components

Material	Description
	**RJ45 network card:** Is the device that allows the PC to connect to the local network by an RJ45 Ethernet cable (network cable).
	**Switch/Ethernet Switch:** A switch (network switch) is a device used to connect several elements in a computer network.
	**Mode :** is a device used to communicate with remote computers over a telephone network. A Modem is made up of at least two ports: • One port for the local network (LAN), • One port for the remote network (Internet).
	**ADSL router:** A modem router or ADSL router (like the Djaweb modem) integrates in addition to the router: • a modem (for remote connection), • a switch to connect several devices to the local network.

Network Topology

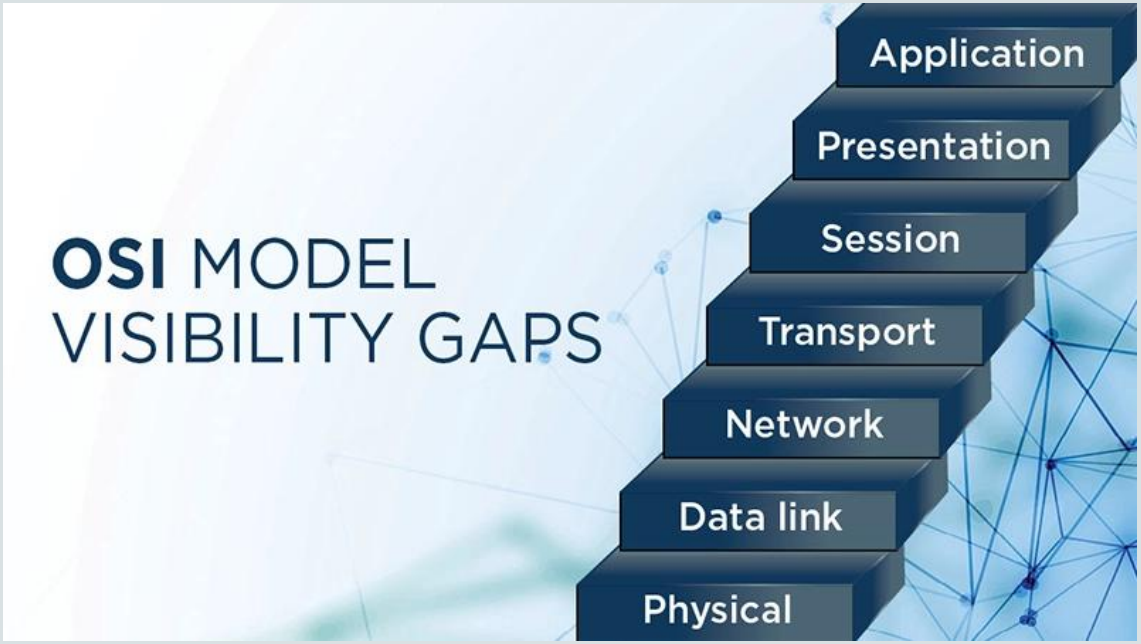
In Computer Network ,there are various ways through which different components are connected to one another. Network Topology is the way that defines the structure, and how these components are connected to each other.

The Network Topology is the layout arrangement of the different devices in a network. Common examples include Bus, Star, Mesh, Ring, and Daisy chain.

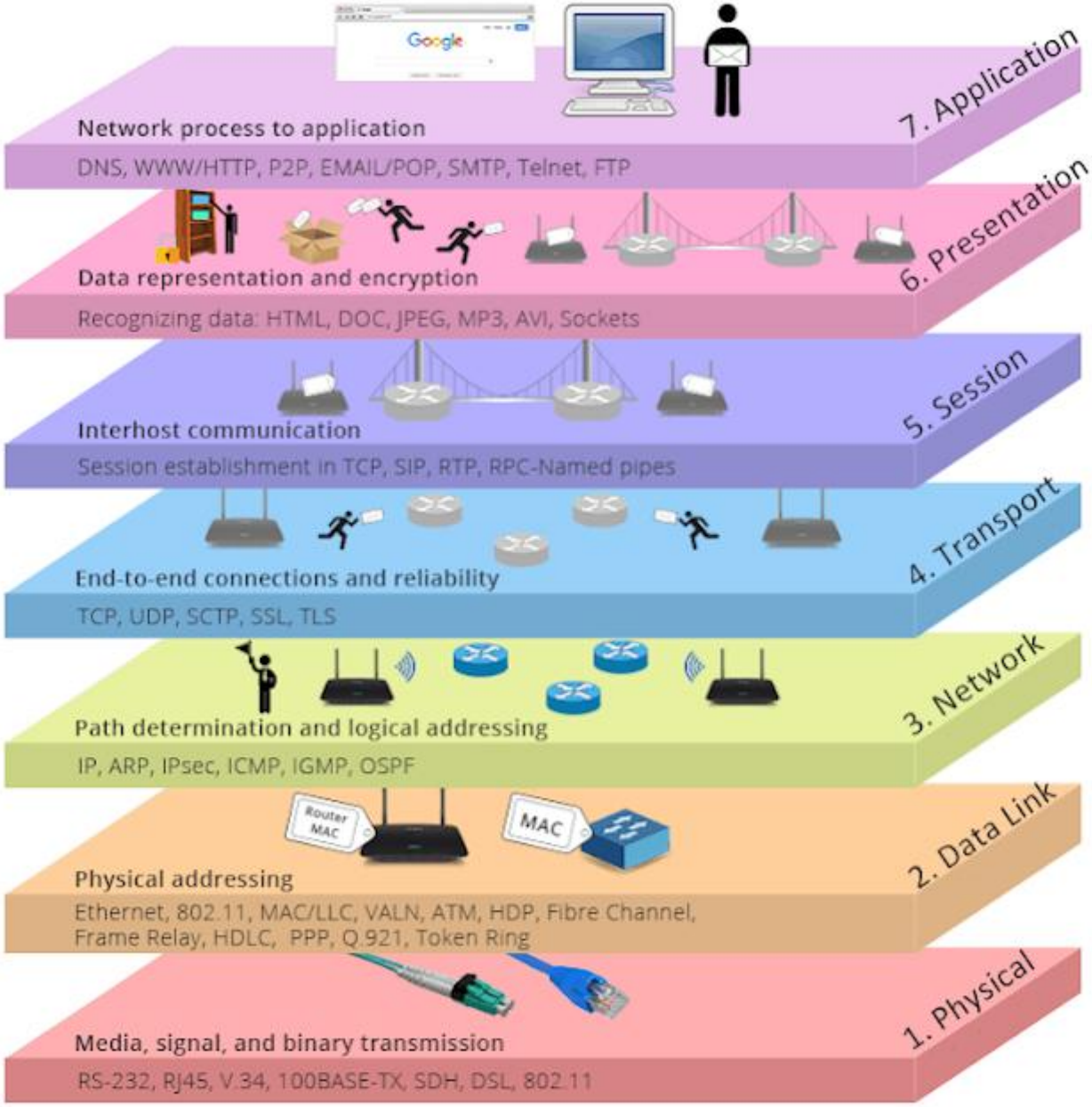


OSI Model

The OSI model **Open Systems Interconnection**, created in 1984 by ISO, is a reference framework that explains the process of transmitting data between computers. It is divided into seven layers that work together to carry out specialised network functions, allowing for a more systematic approach to networking.



OSI Model


Google
7. Application
Network process to application
DNS, WWW/HTTP, P2P, EMAIL/POP, SMTP, Telnet, FTP
6. Presentation
Data representation and encryption
Recognizing data: HTML, DOC, JPEG, MP3, AVI, Sockets
5. Session
Interhost communication
Session establishment in TCP, SIP, RTP, RPC-Named pipes
4. Transport
End-to-end connections and reliability
TCP, UDP, SCTP, SSL, TLS
3. Network
Path determination and logical addressing
IP, ARP, IPsec, ICMP, IGMP, OSPF
Router MAC
MAC
2. Data Link
Physical addressing
Ethernet, 802.11, MAC/LLC, VALN, ATM, HDP, Fibre Channel,
Frame Relay, HDLC, PPP, Q.921, Token Ring
1. Physical
Media, signal, and binary transmission
RS-232, RJ45, V.34, 100BASE-TX, SDH, DSL, 802.11

IP address عنوان IP

An IP address is a unique number used to identify a printer, device (computer, smartphone, modem) connected to a computer network.

Noticed

An IP address is stored in 32 bits and composed of 4 numbers (between 0 and 255) separated by periods.

Example:

204.35.129.3 192.168.0.1

In general, in a local network or home network, the first three numbers are identical, only the last number is changed.

Examples:

192.168.1.1 192.168.1.2 192.168.1.3 ..... 192.168.1.146

توصيل الكمبيوتر بالشبكة
Connecting a computer to a network

in most cases, setting up a network involves connecting the computer to the Internet via an ADSL modem. There are three possible cases:

- Connect via wired network (network cable)

As soon as you connect the computer to the modem or switch, the connection is effective. There is nothing to configure on the computer.

- Connect to a wireless network (Wi- - Fi) (Wi- -

Activate WiFi, choose one of the available networks and enter its password. Until next time, your device will automatically connect to this Wi-Fi network.

1) You must select the SSID name of the Wi-Fi Router (for example: DJAWEB_E4),

2) Connect by entering the security key requested,

3) Check Automatically connect to this network.

- Connect via mobile network (3G, 4G, etc.)

You need a SIM card, similar to that of your mobile phone (Smartphone), and one of the following holders in which you insert it:

3G/4G key 3G/4G router Smartphone

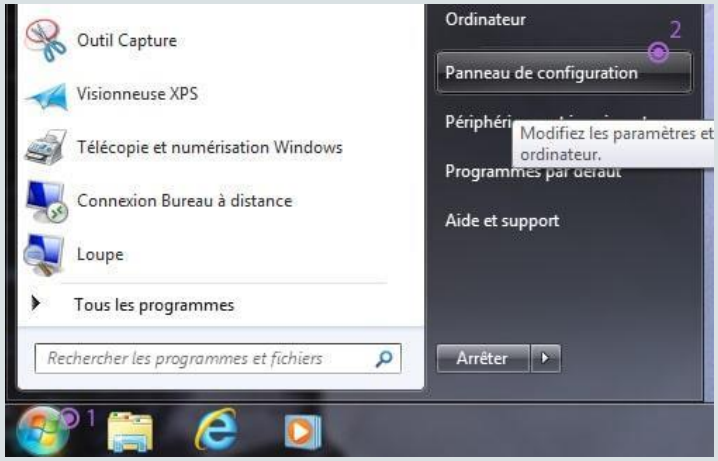
مشاركة الملفات في ويندوز
Sharing files/folders in Windows 7

First of all, we must activate the sharing of documents, the network discovery(i.e. allow Windows to
search for other computers), and disable password prompt(so other computers can connect without a
password).

Here are the steps to follow:

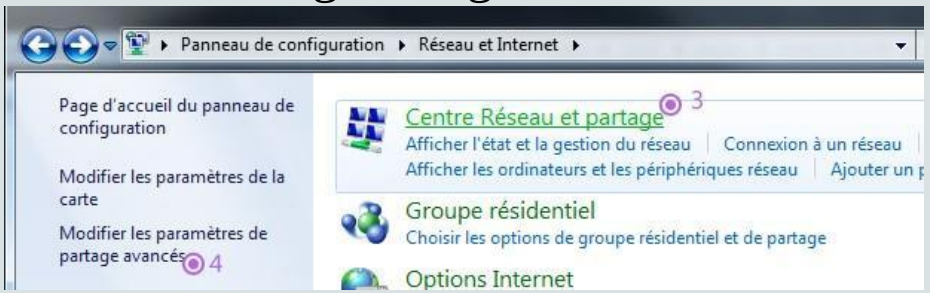
1) Click on the start button at the bottom of the screen

2) Choose Control Panel to the right and click on it



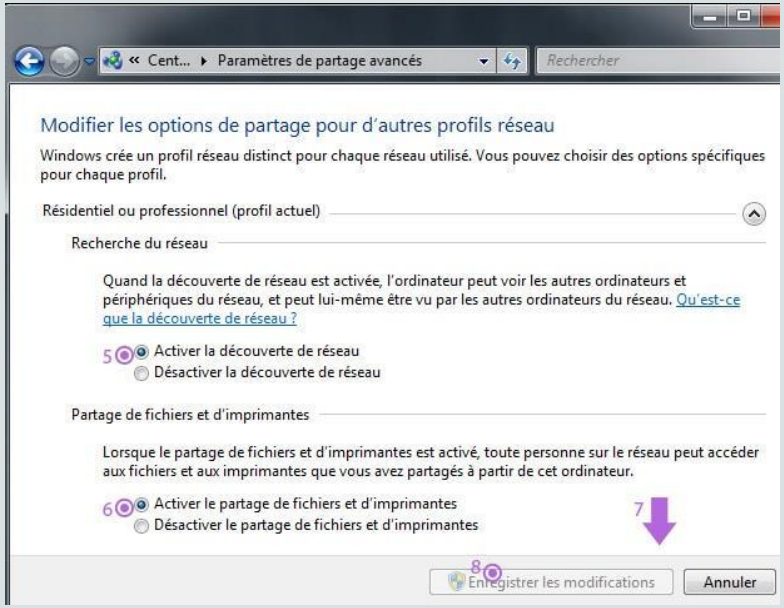
مشاركة الملفات في ويندوز
Sharing files/folders in Windows 7

3) Click on Network and Internet(in green), then on Network and Sharing Center
4) In the left column, click on Change advanced sharing settings



5) Click on Enable network discovery
6) Click on Enable file and printer sharing

7) Go down using the mouse wheel and click on Disable password-protected sharing
8) Click on Save Changes



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