



# هندسة الشبكات

## PC Networking

# المحتويات

## تعريف الشبكات

### القسم الأول: أنواع الشبكات السلكية وطرق ربطها

- LAN (Local Area Network)
- WAN (Wide Area Network)
- MAN (Metropolitan Area Network)
- Network Bus
- Network Ring
- Network Star

### القسم الثاني: البروتوكولات

- 
- TCP/IP
- OSI TCP/IP
- 
- TCP /

## القسم الثالث: مكونات الشبكة

NIC

- 
- 
- 
- 

## القسم الرابع: تشغيل الشبكة Network Driver

## القسم الخامس: إعدادات شبكة بين جهازين في Windows Xp

- 
- 

## القسم السادس: أمن الشبكات

## القسم السابع: مشاكل ونصائح هامة في الشبكات

# الشبكات

MODEM

CD-ROM

FILES

PRINTERS

FAX



(LAN) Local Area Network

LAN

## القسم الأول: أنواع الشبكات السلكية

:

LANs

•

MANs

•

WANs

•

**LAN (Local Area Network)**

LAN

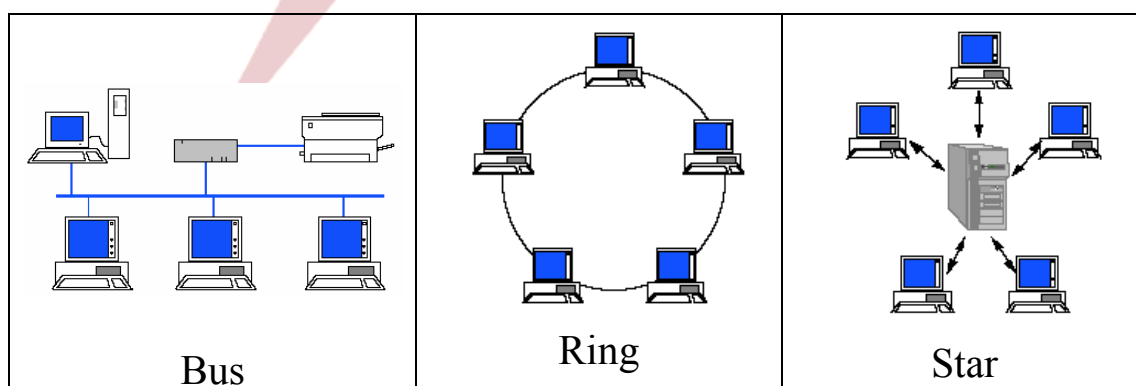
)

(

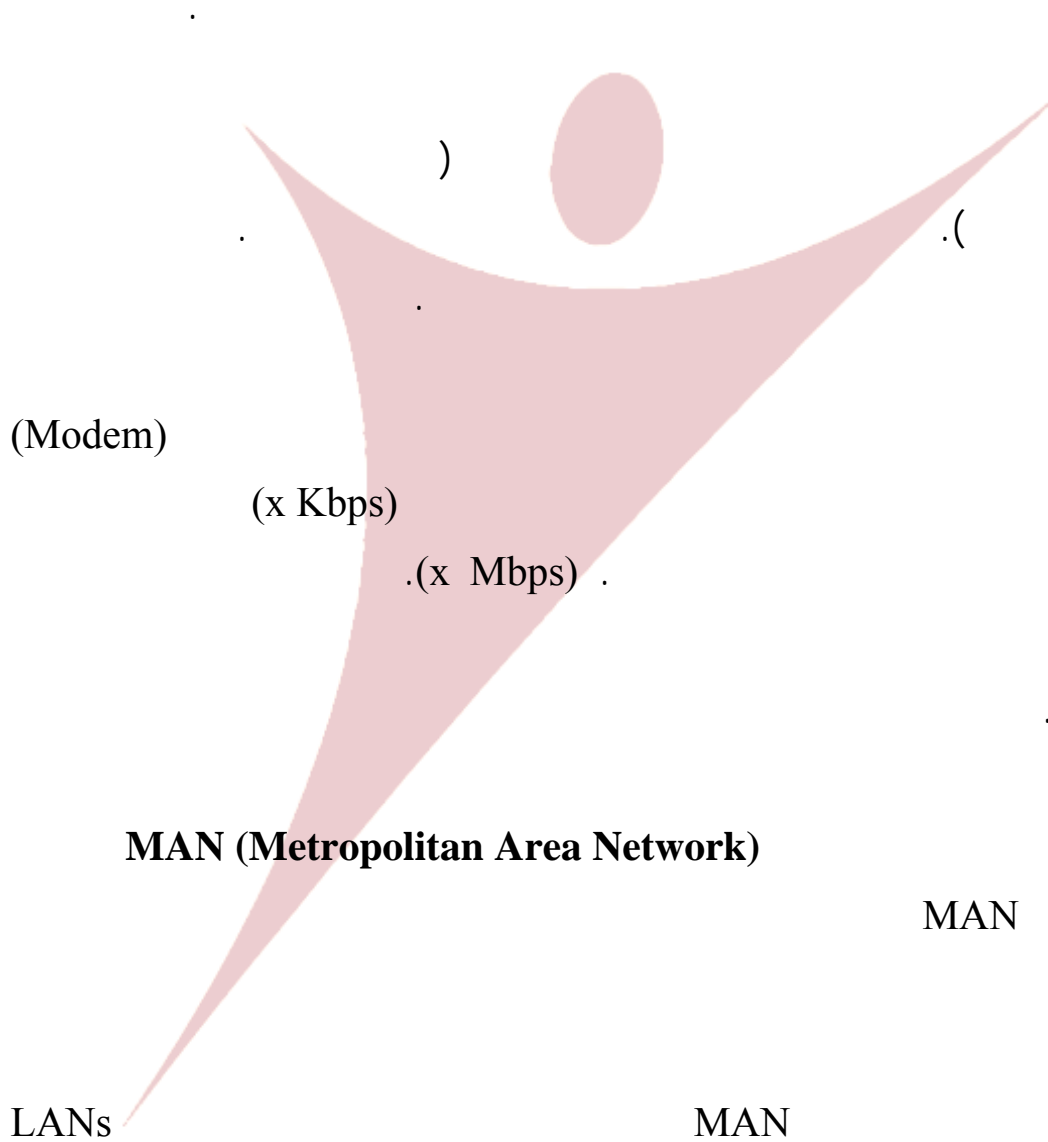
1000 100 10

.(

)



## WAN (Wide Area Network)



:

MAN	WAN	LAN	
		2000	
		4 1000 (4 to 1000 Mbps)	
	(Kbps)	2	
(Multiplexer)	(Multiplexer)		
T1, X25, ISDN, Modems	T1, X25, ISDN, Modems	Ethernet, Token-Ring, FDDI	
-	-	24/ 24	



## ربط الشبكات:

: LAN

Backbone

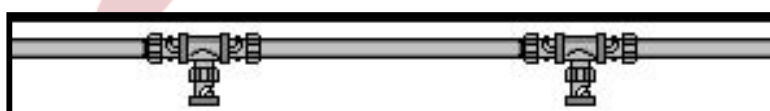
Bus - 1

Star - 2

Ring - 2

: Network Bus

Coaxial



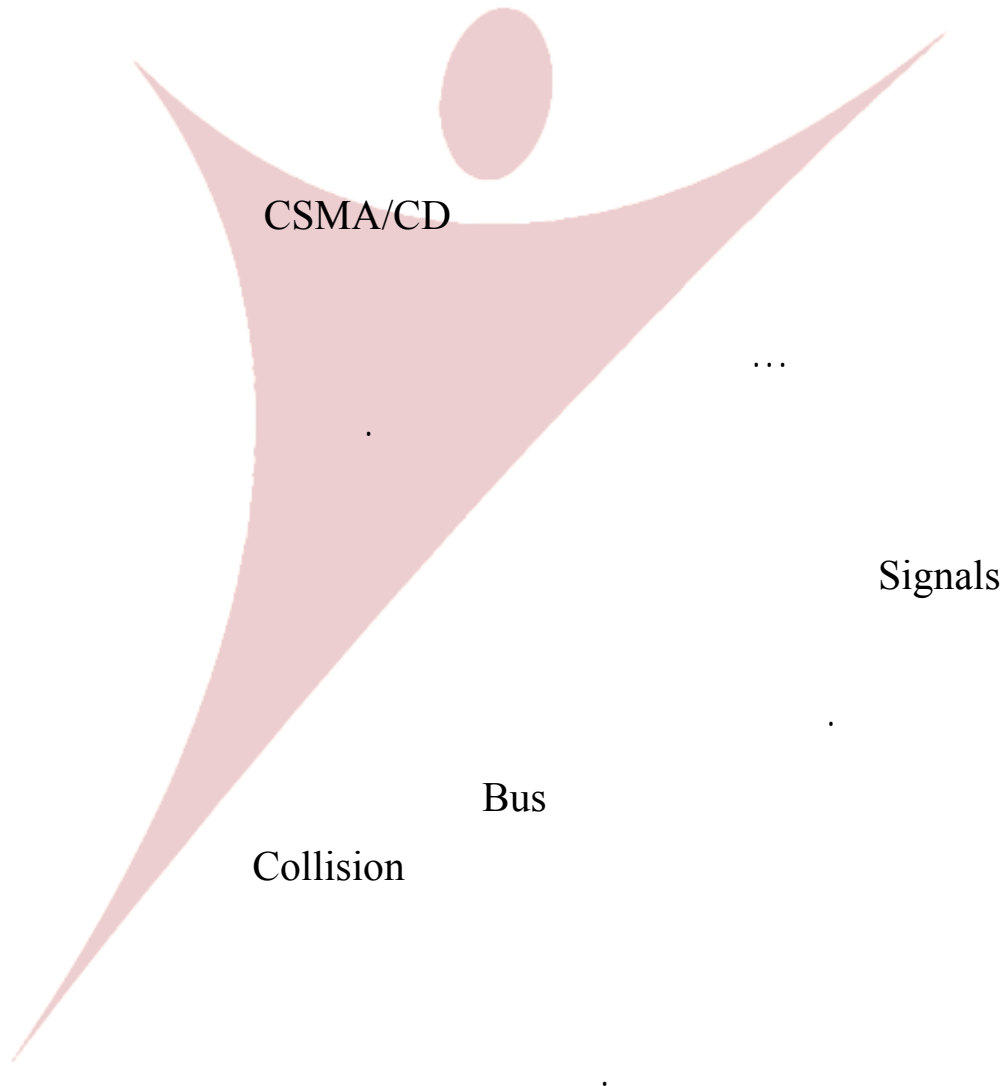
Bus

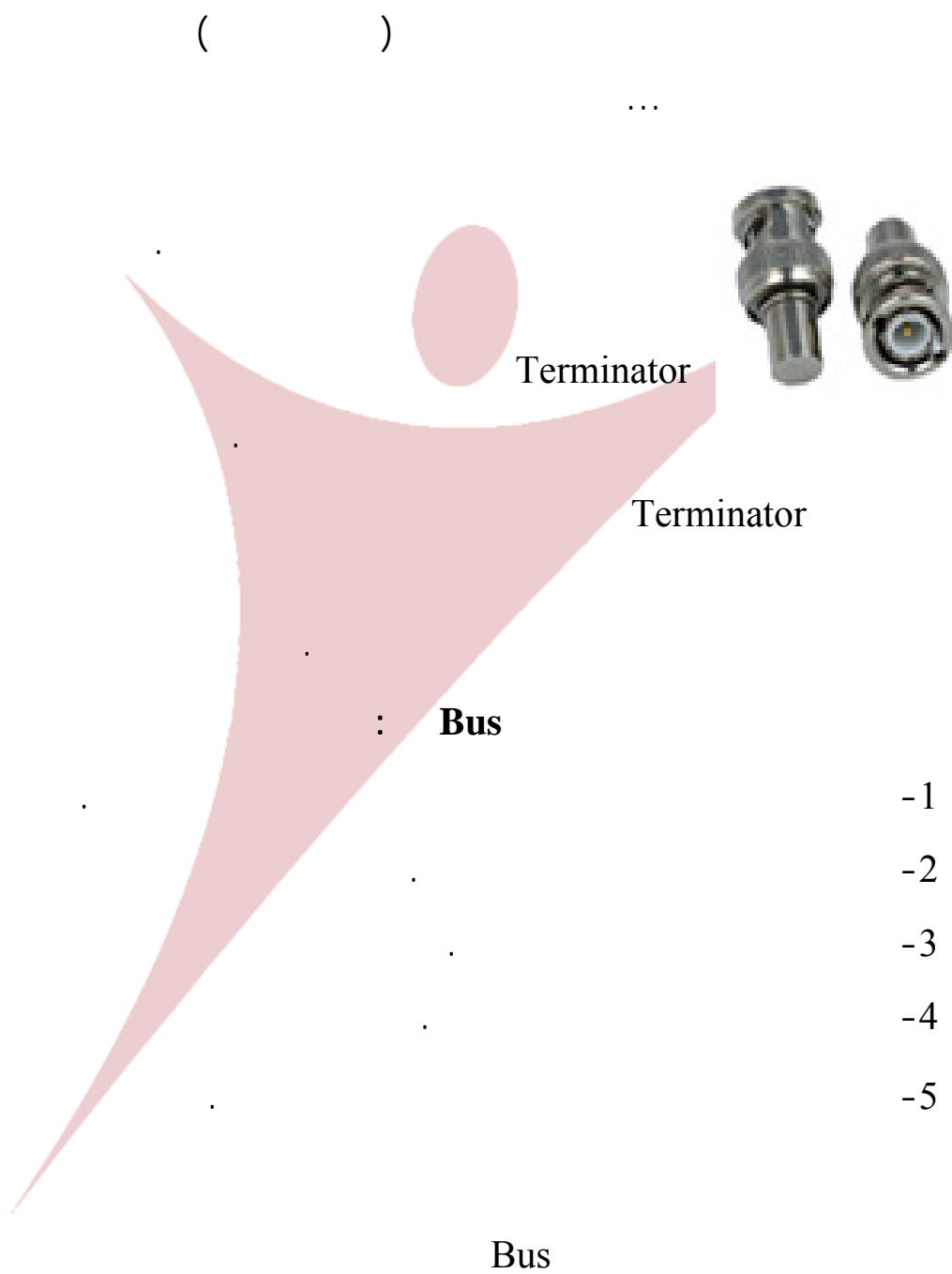
(Segment )

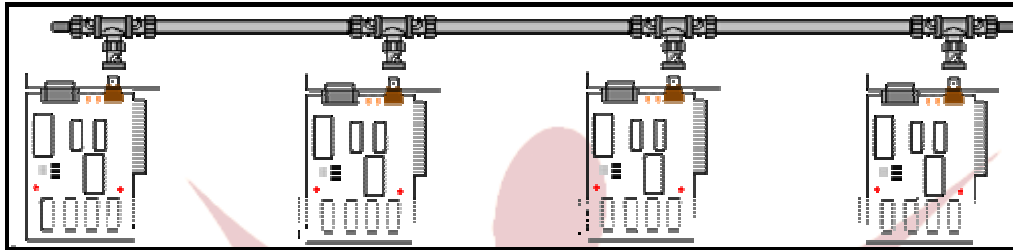
.Linear Bus

( )  
T

BNC

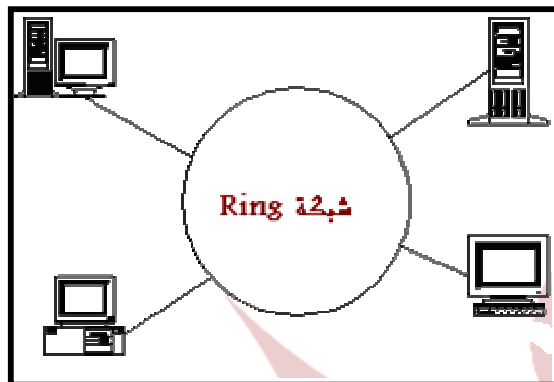






Repeater

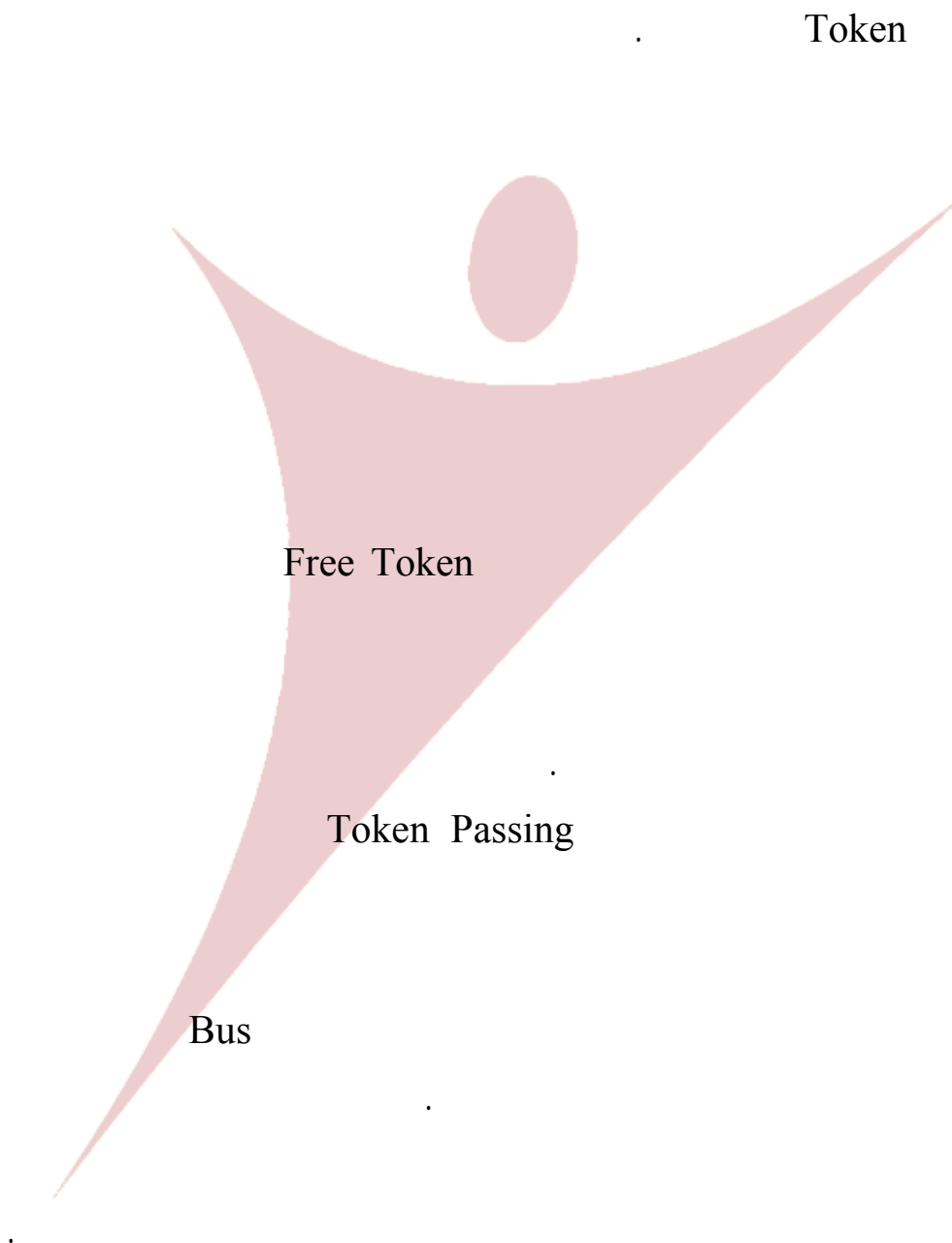
## : Network Ring



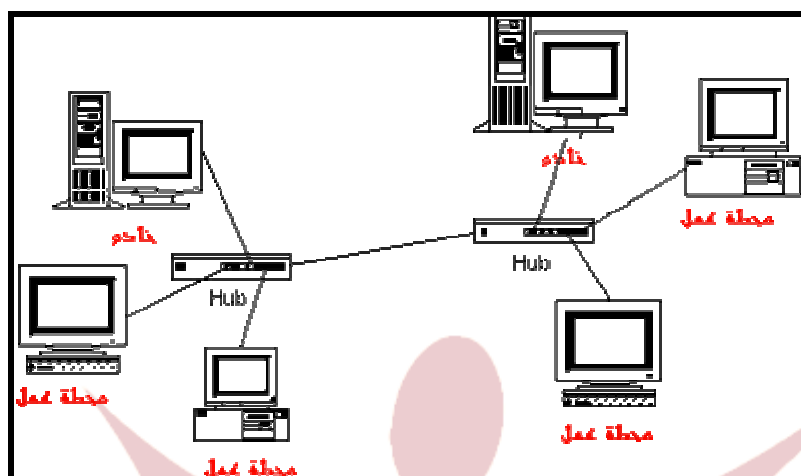
Token

Token Passing

Token Free



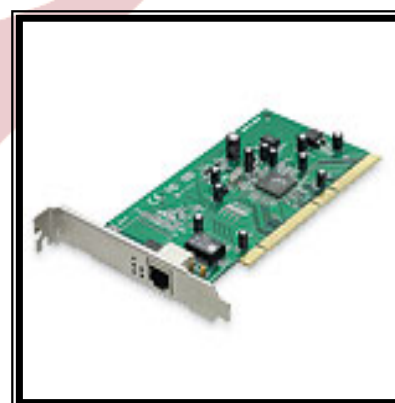
**: Network Star**



(Fast Ethernet)

(Mbps)

100  
10



.(Cat5)

10/100Base-T RJ-45

RJ-45

RJ-45

10/100Base-T

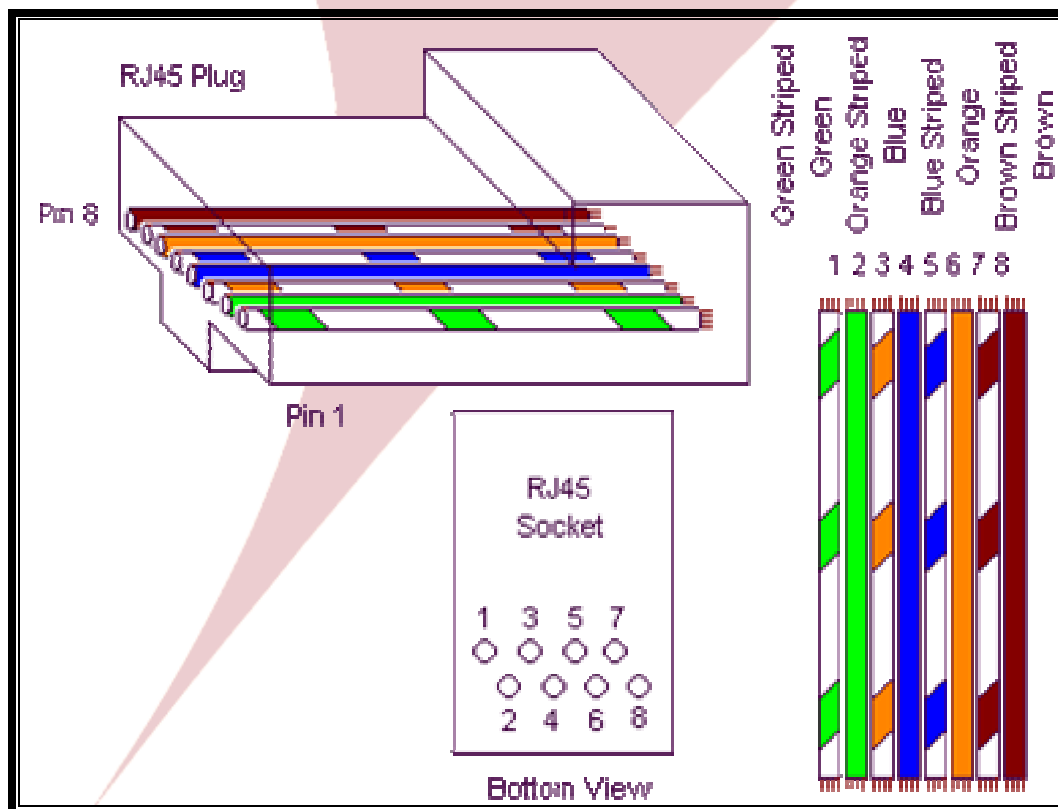
Cat5 .

(traffic)

(bandwidth)

( ) Cat

(crossover)



### :Hubs



Active Hub . -1

Passive Hub. -2



Hybrid Hub . -3

Active Hub

Repeater

( ) 12 8

.Multiport Repeater

Passive Hub

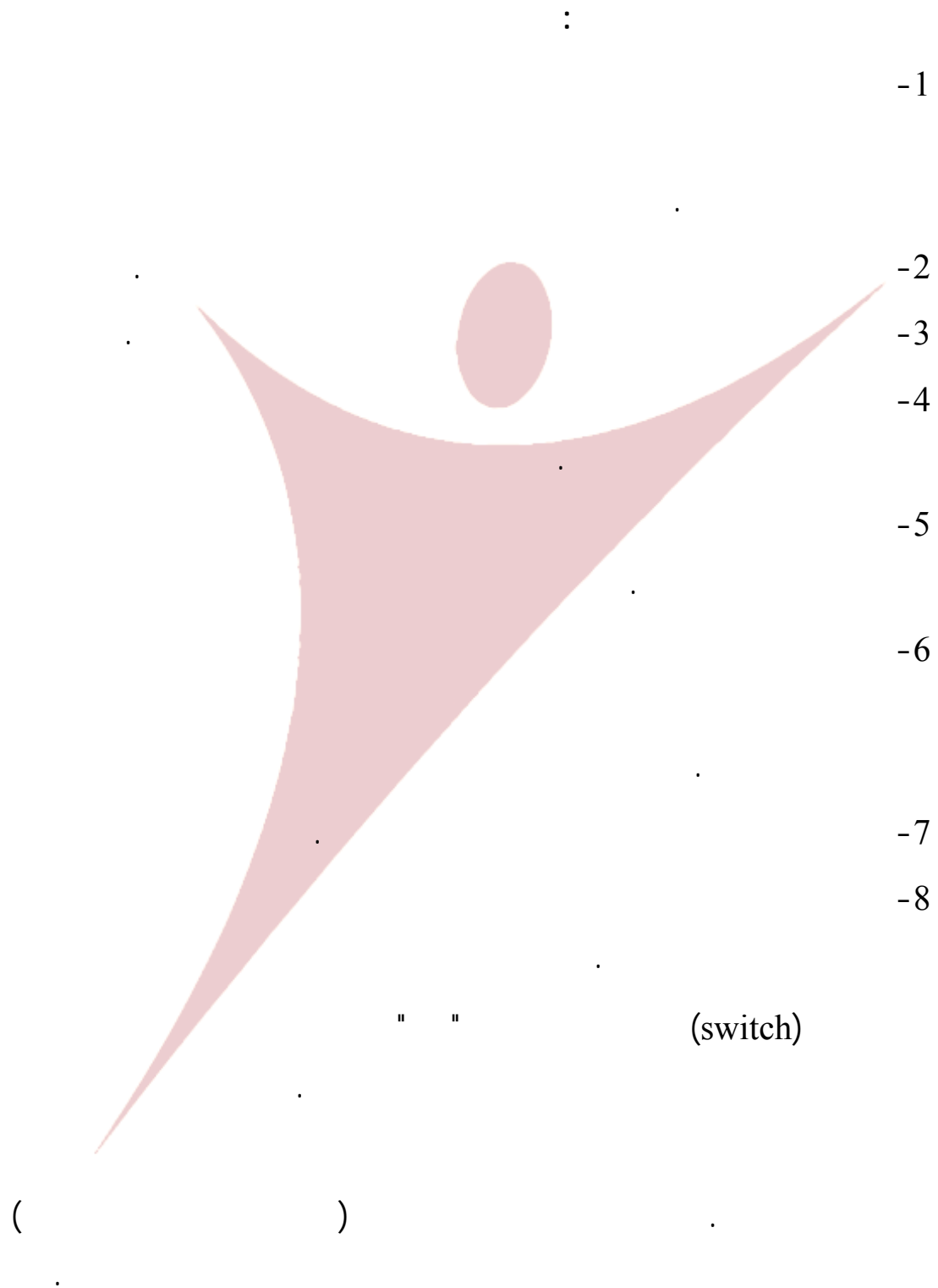
Hubs Hybrid

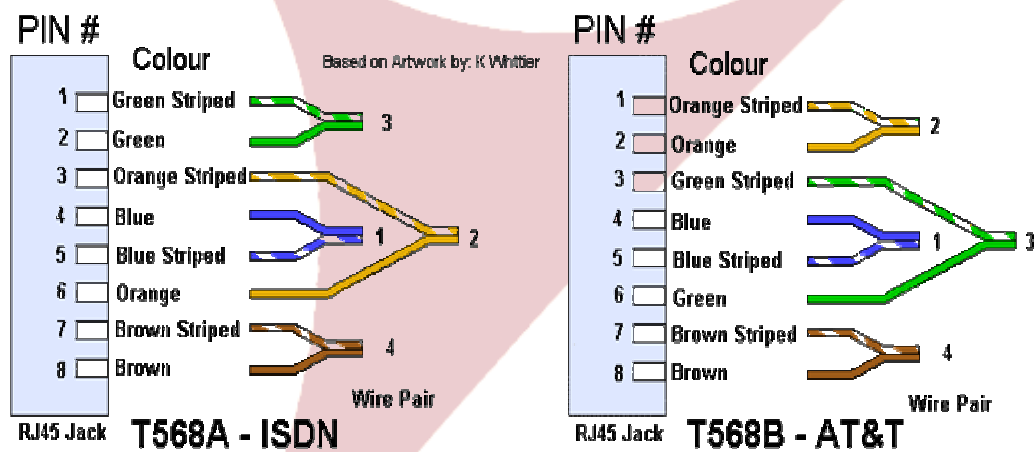
Star

(Shielded Twisted Pair STP)

Coaxial

.Fiber Optic





## مهمة دراسية:

..

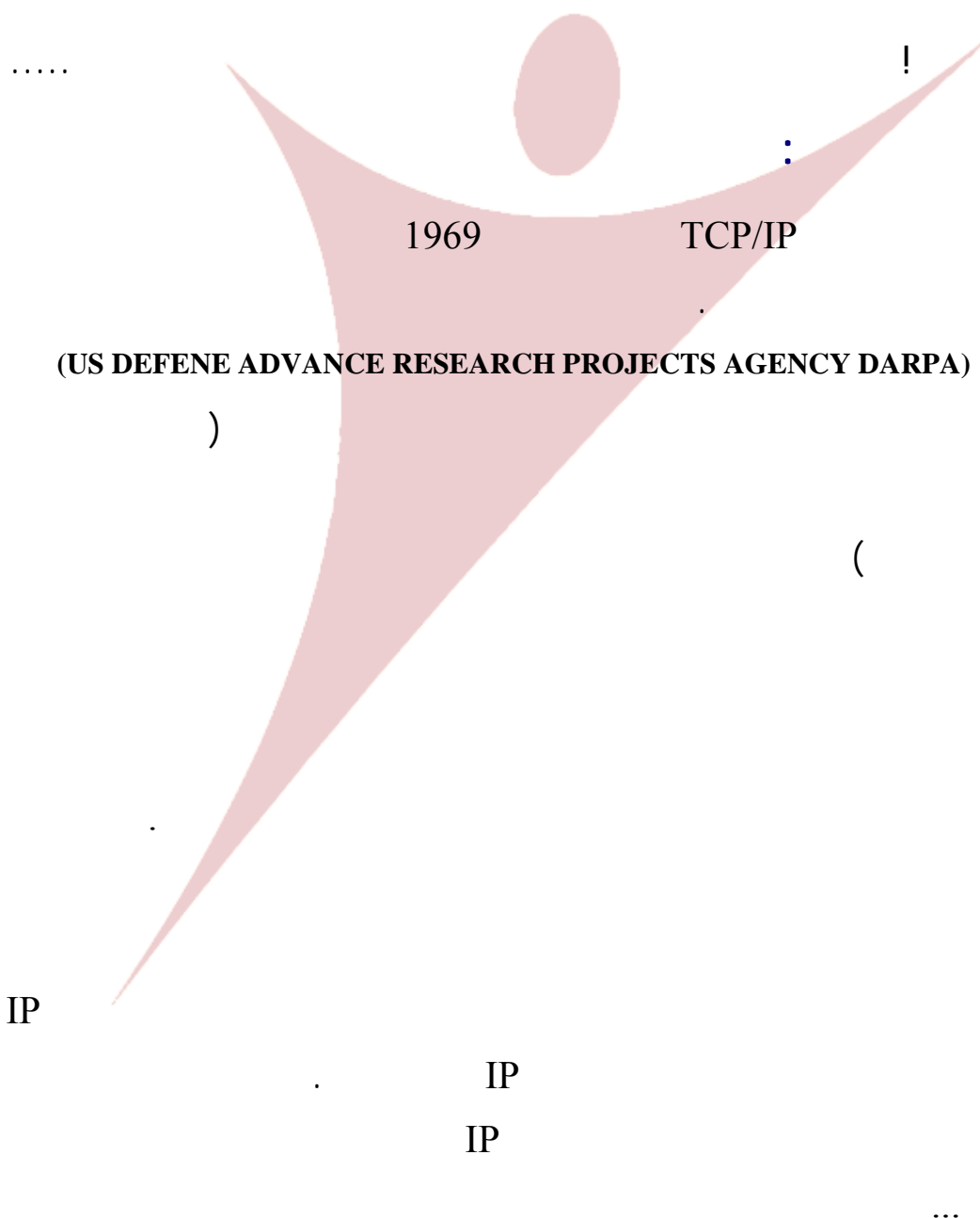
10

...

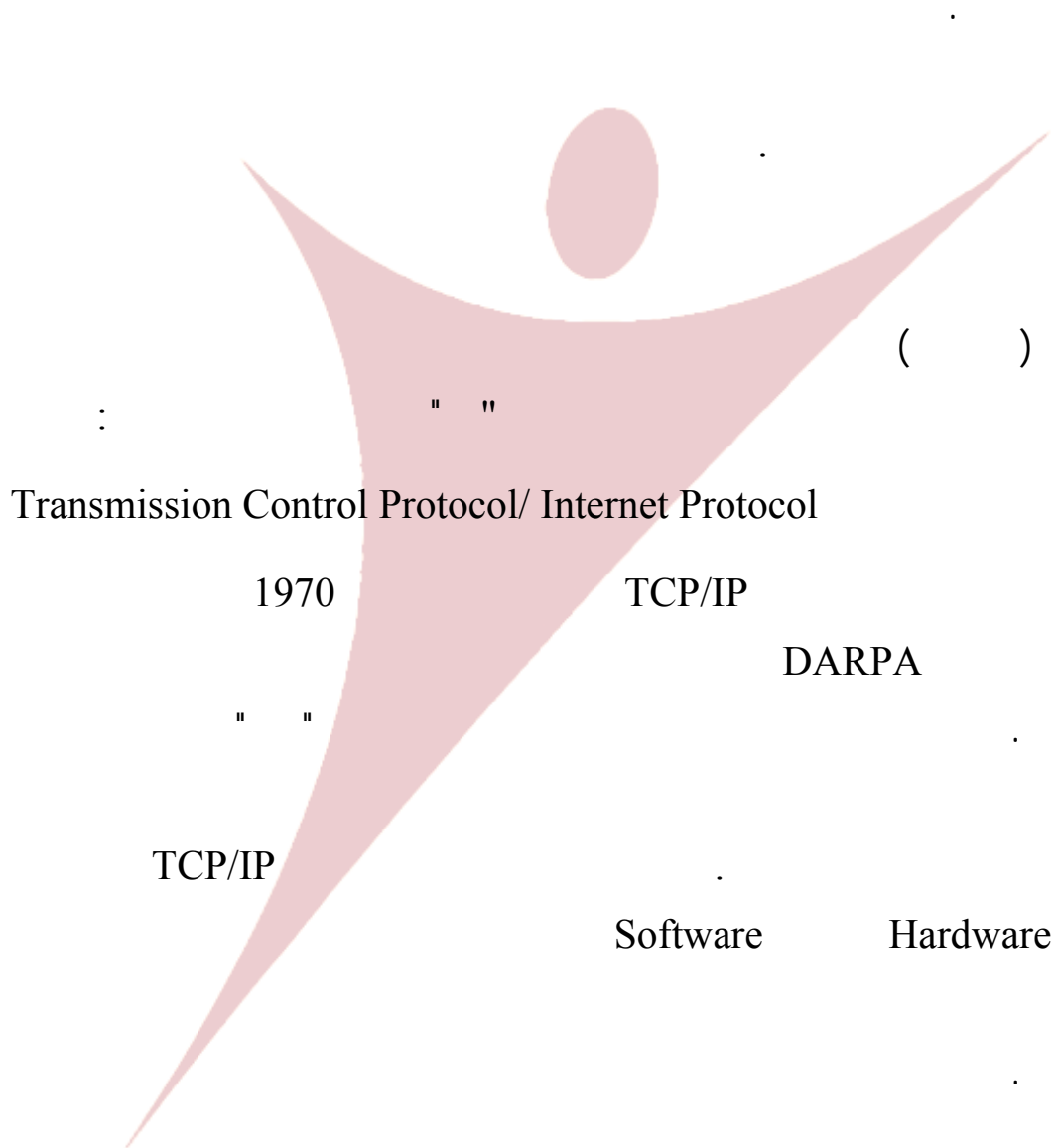
25

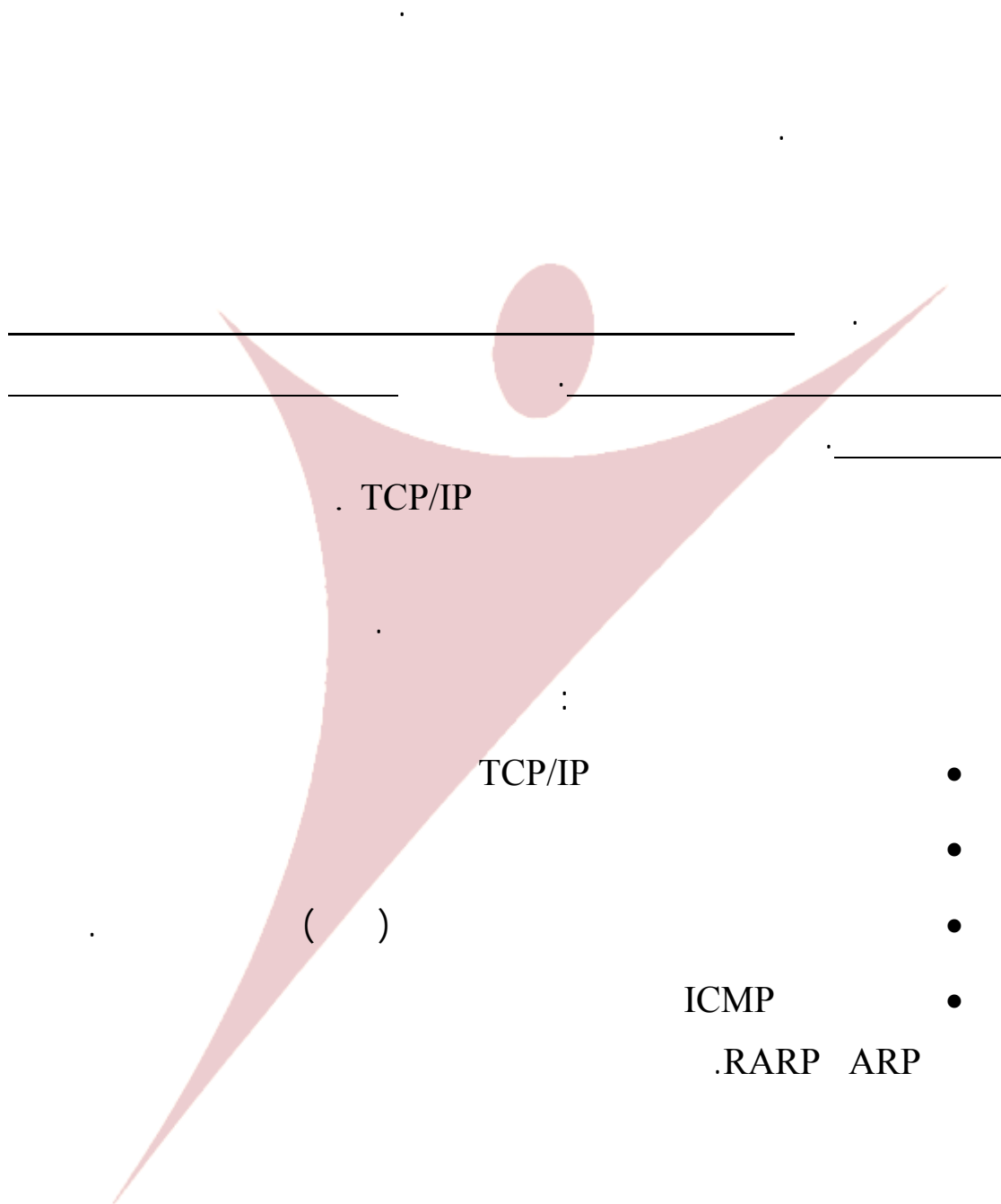


## القسم الثاني: البروتوكولات



## TCP/IP



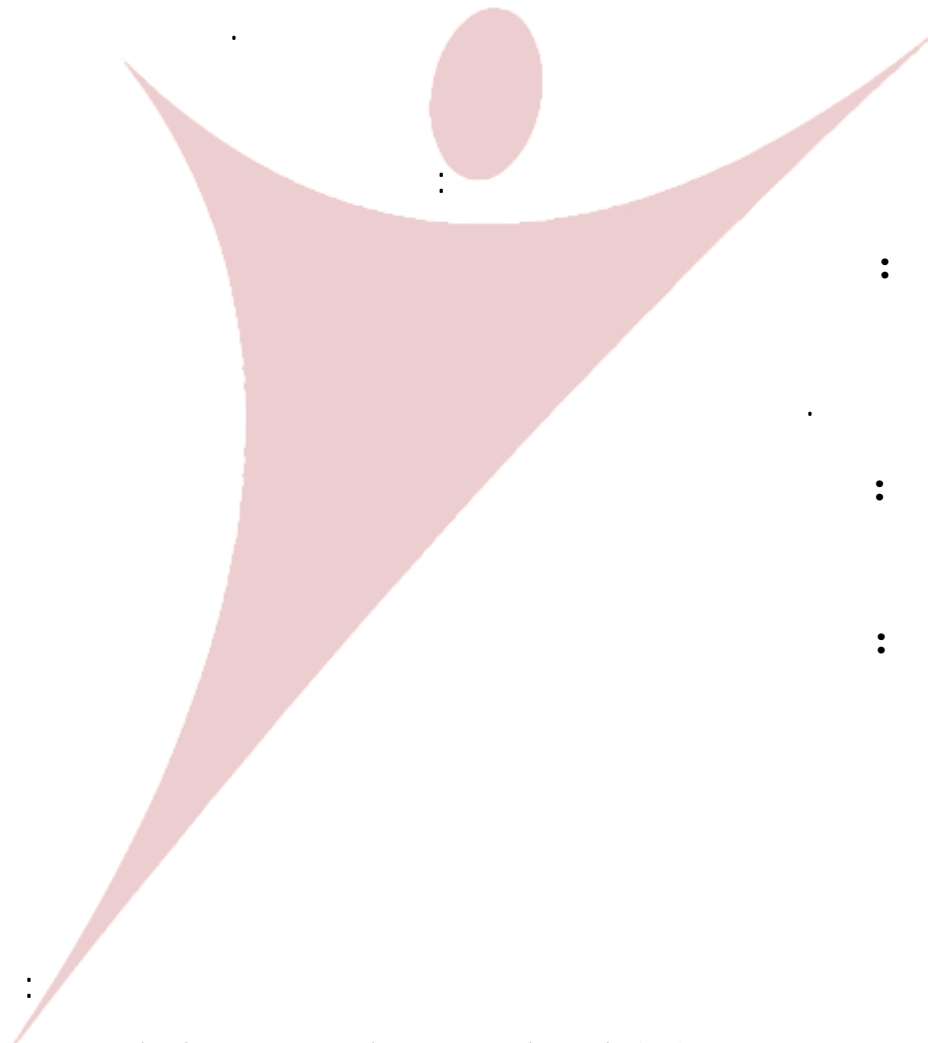


# **:OSI      TCP/IP**

(Internet protocol)

(TCP/IP)

(packets)



(TCP) Transmission Control Protocol and (IP) Internet protocol

TCP/IP

**: TCP/IP**

.(DARPA)

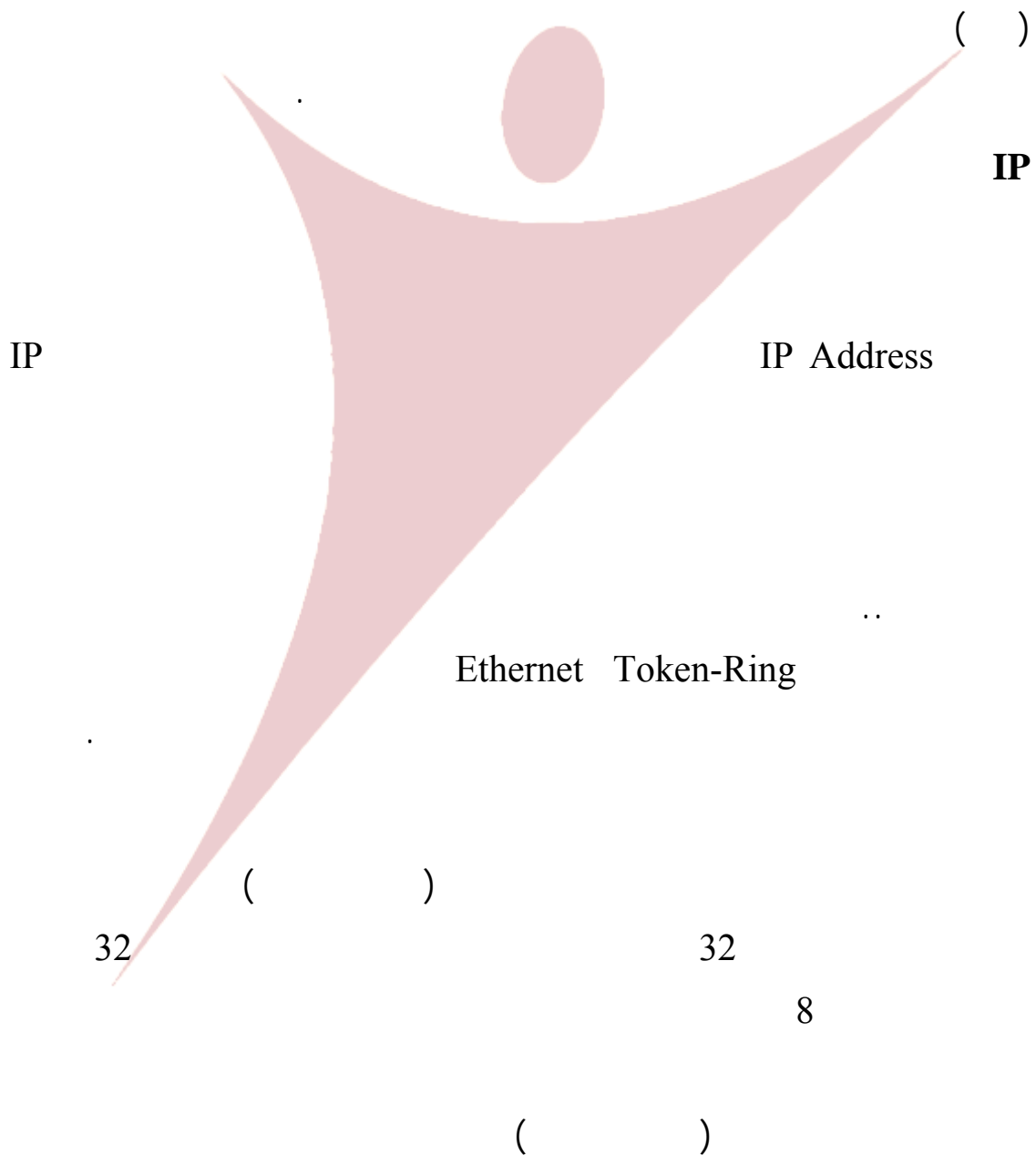
TCP/IP

.DARPA



TCP/IP

Berkeley Software Distribution



4	32	255
---	----	-----

4	32	255
---	----	-----

4	32	255
---	----	-----

255

208.148.28.60

63.209.3.102

( )

( )

## DOMIAN NAME SERVER

# DOMIAN NAME SERVER

DOMIAN NAME SERVER

## Class based addressing

## Class based addressing

## Class based addressing

:

:

**000.000.000.000 -to- 127.255.255.255**

16777216

 $256^3$ 

:

:

**128.000.000.000 -TO- 191.255.255.255**

65536

:

:

**192.000.000.000 -TO- 223.255.255.255**

256

( )

**ICMP Internet Control Message Protocol**

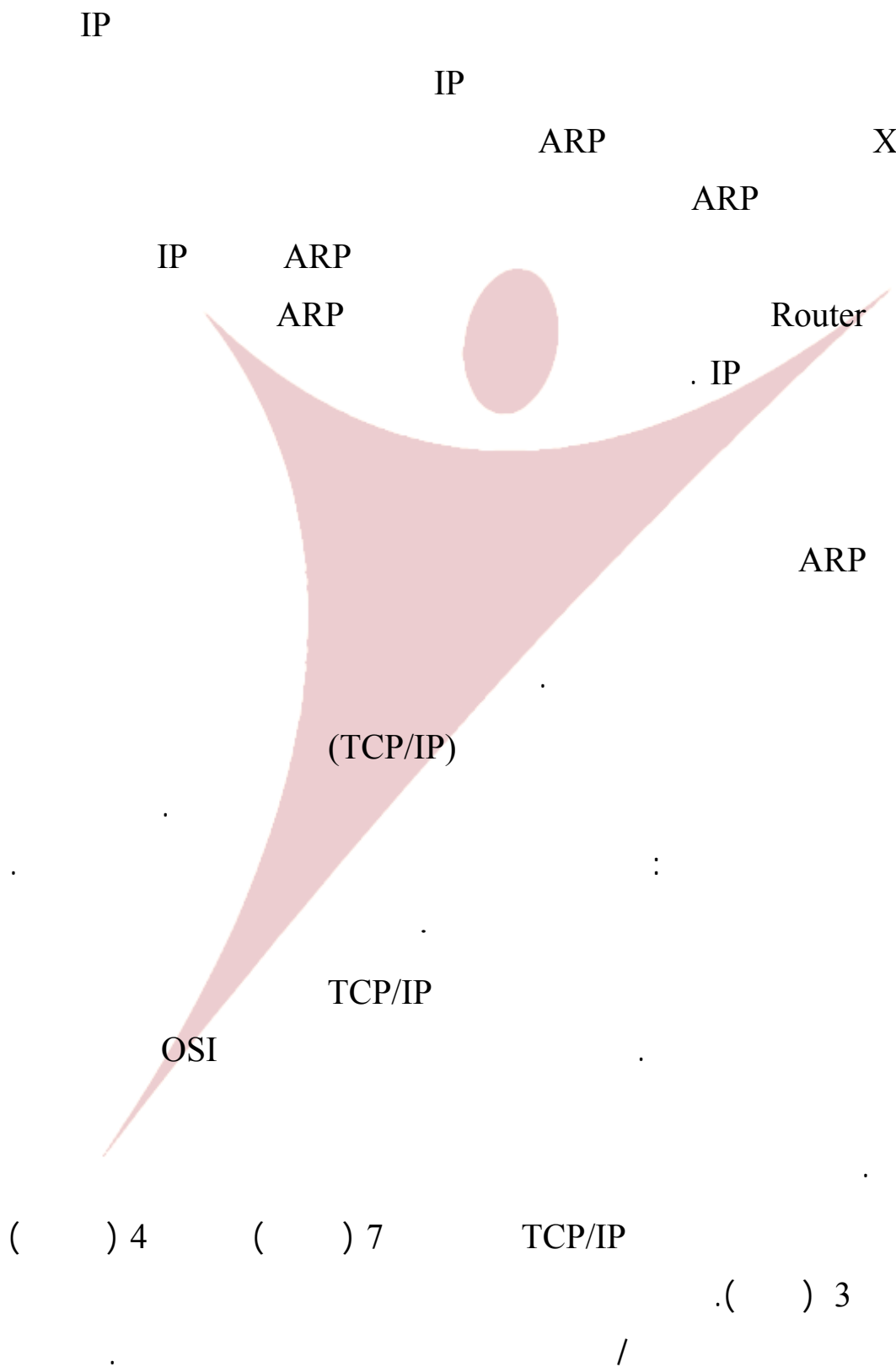
IP

Echo Reply

Echo Request

Ping

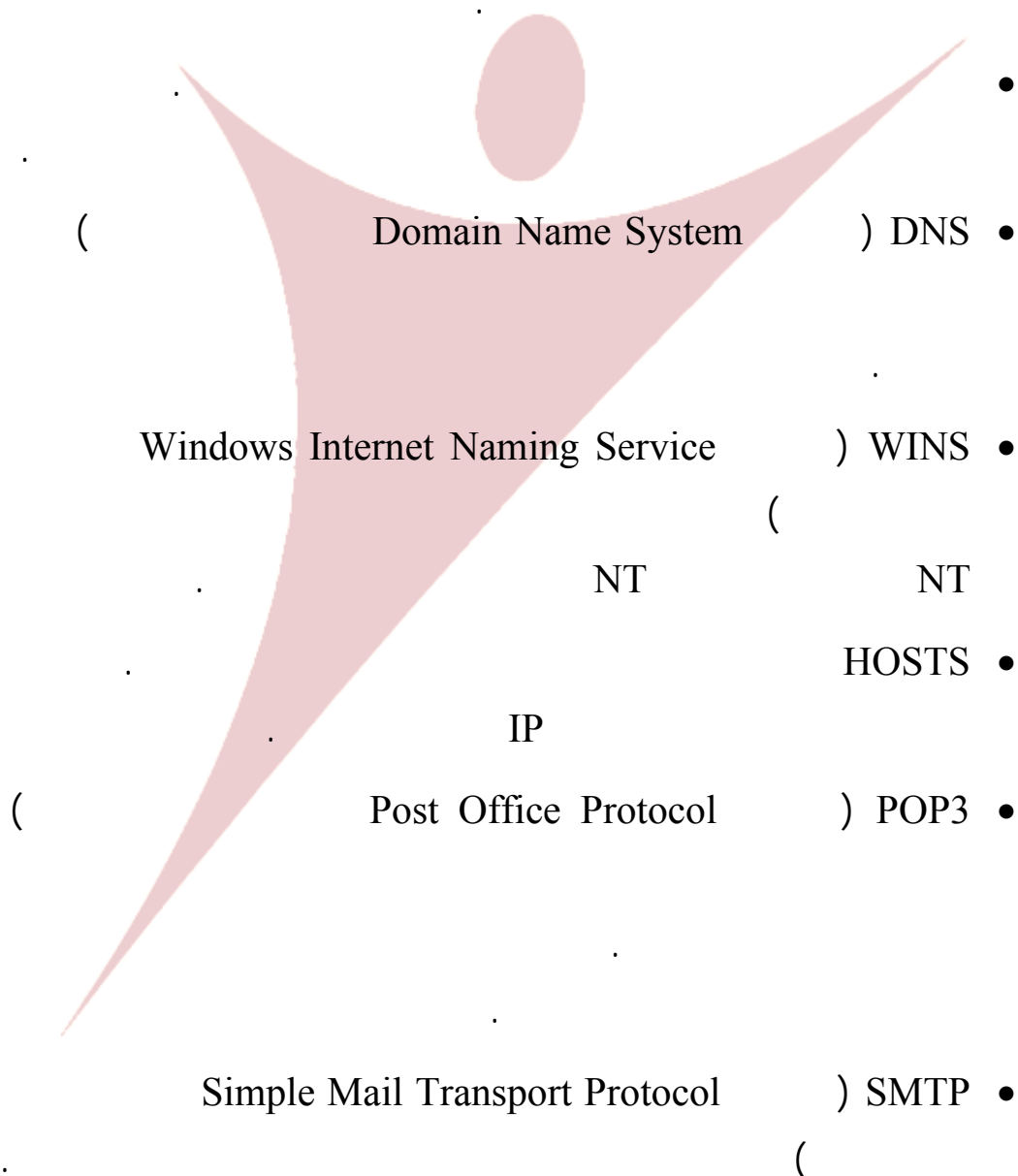
**ARP Address Resolution Protocol**



## TCP/IP

(TCP IP ) 4 3

TCP/IP



Simple Network Management Protocol ) SNMP •

(

.

( File Transfer Protocol ) FTP •

TCP

.FTP

.( )

Trivial File Transfer Protocol ) TFTP •

UDP

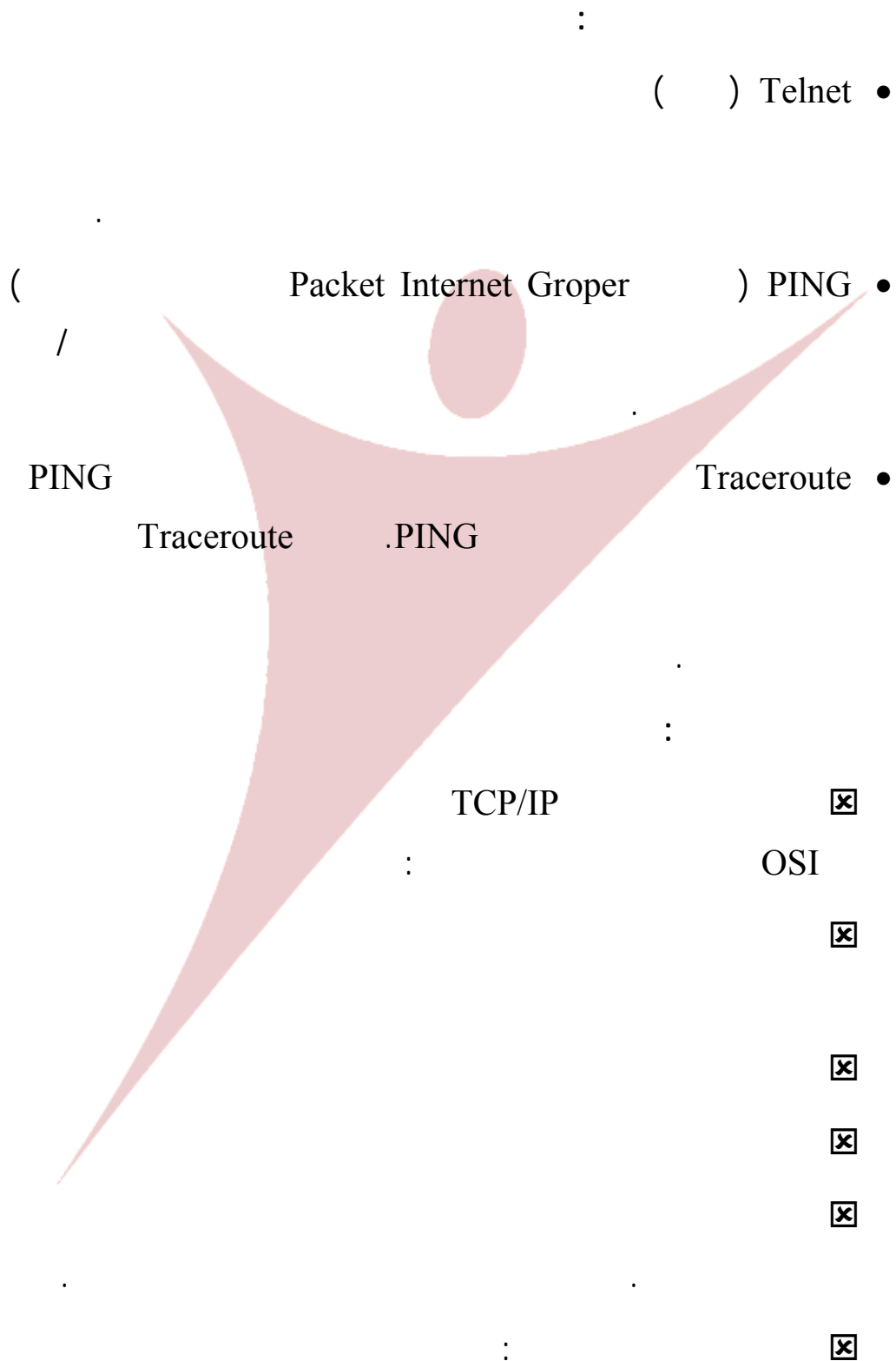
(

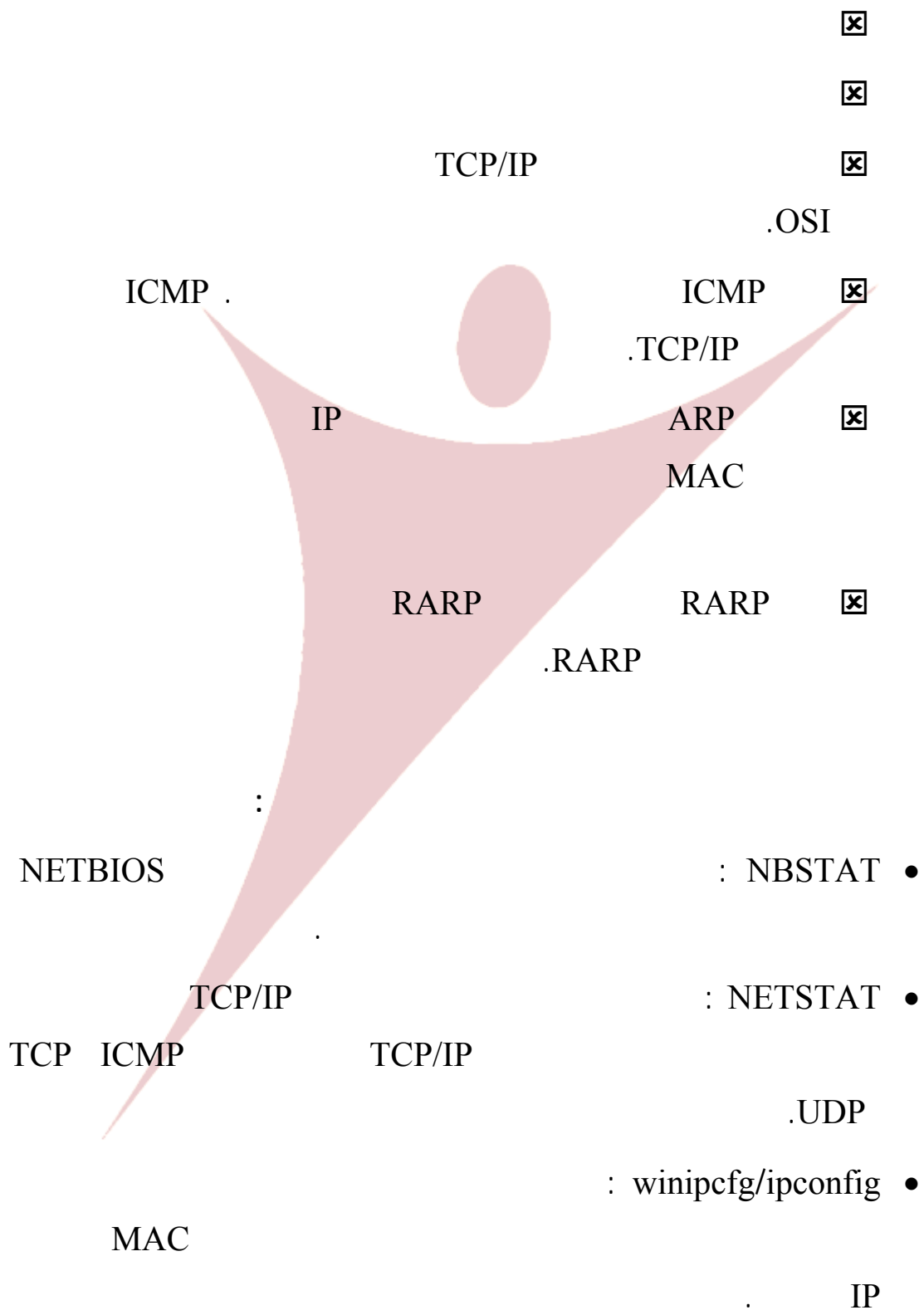
.TFTP

FTP

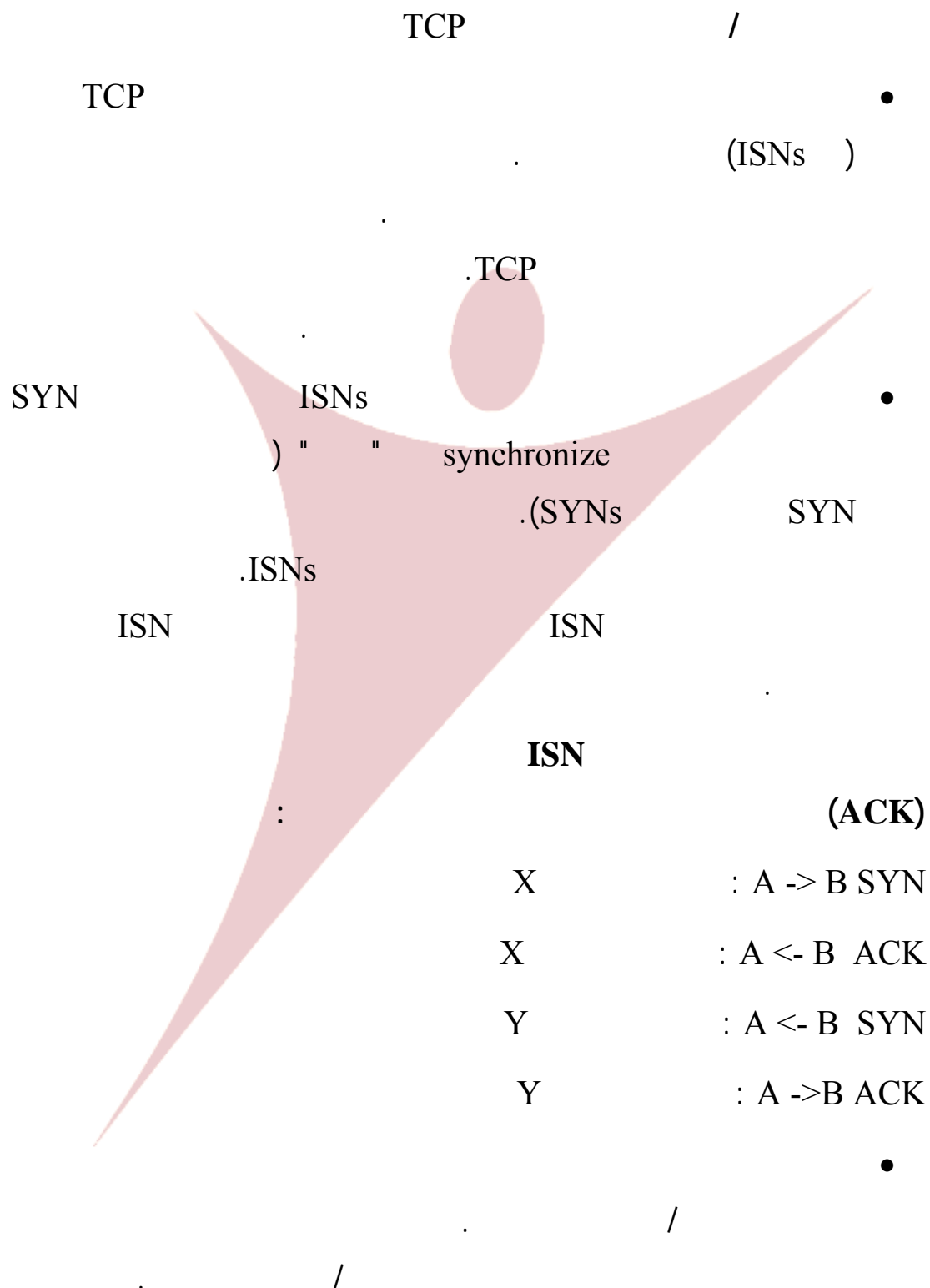
HyperText Transfer Protocol ) HTTP •

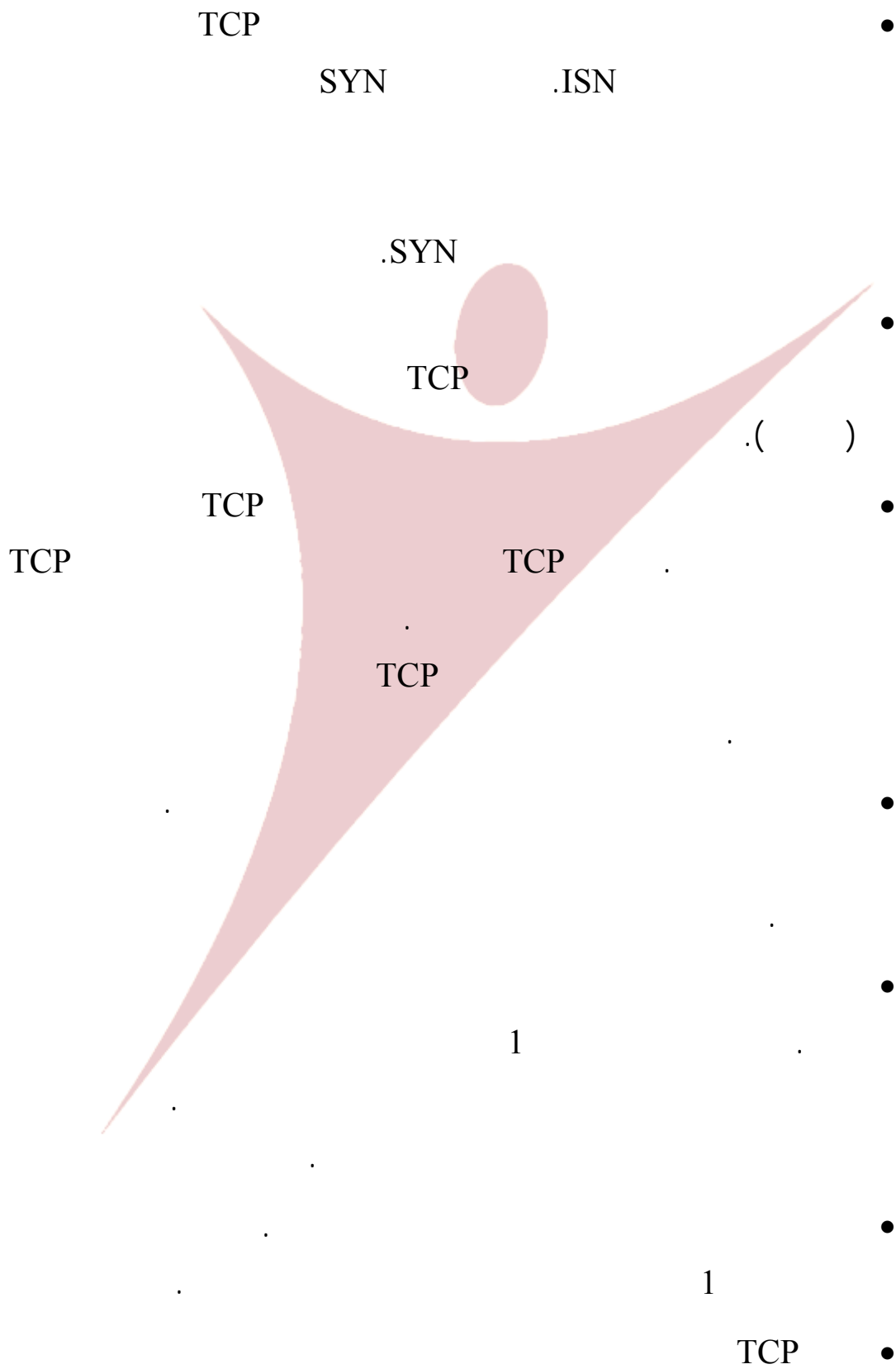
(











TCP •

•

.TCP

TCP

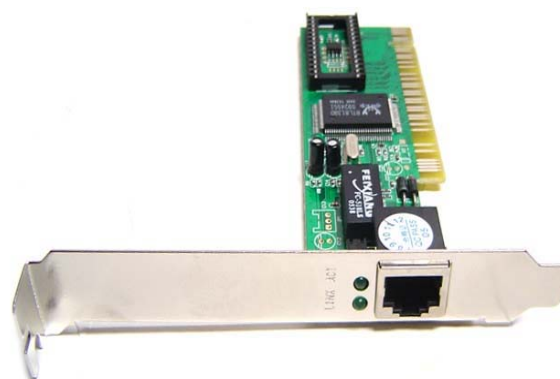
- TCP

TCP

## القسم الثالث: مكونات الشبكة

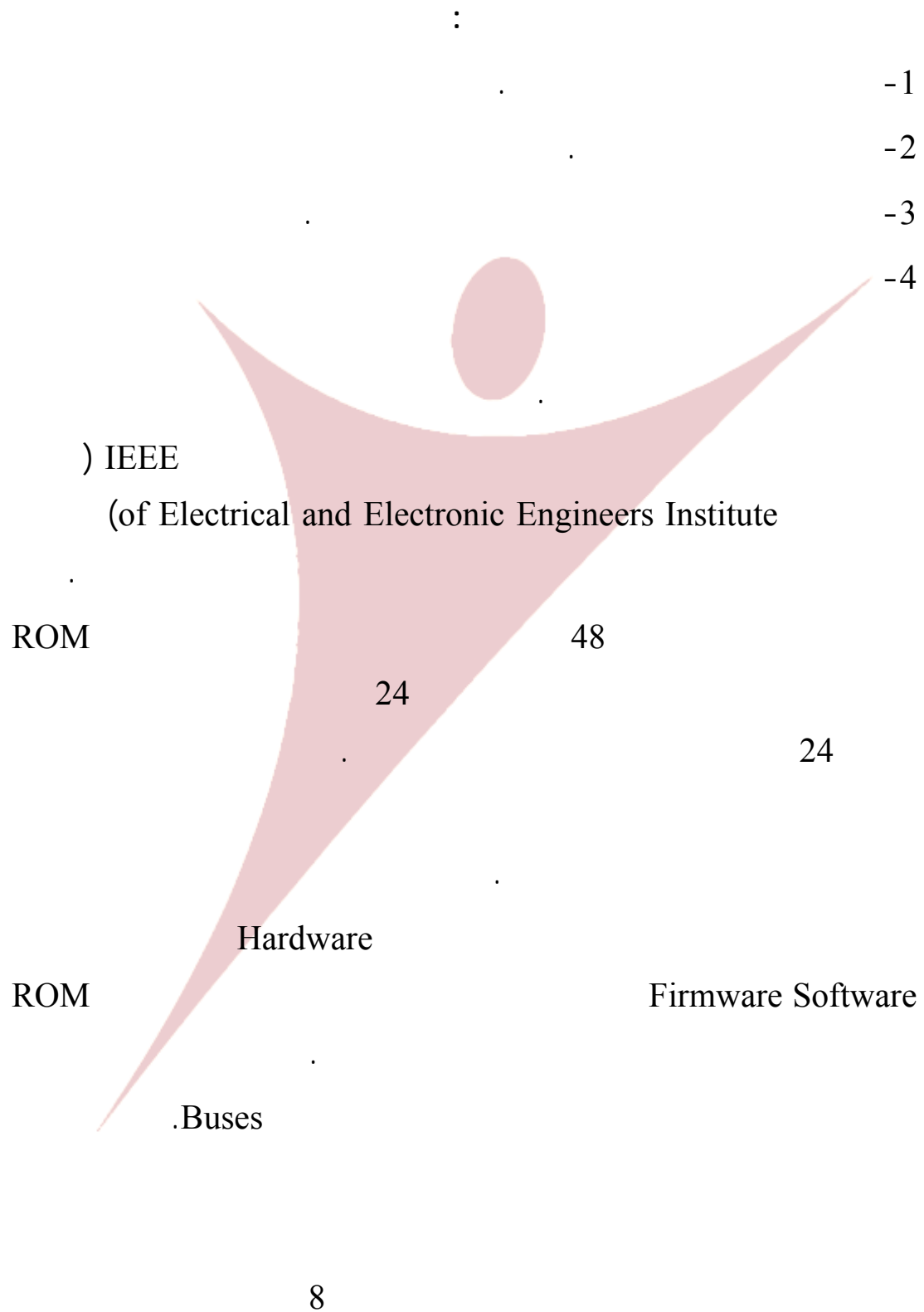
: ; REPEATER ; ROUTER ; HUB

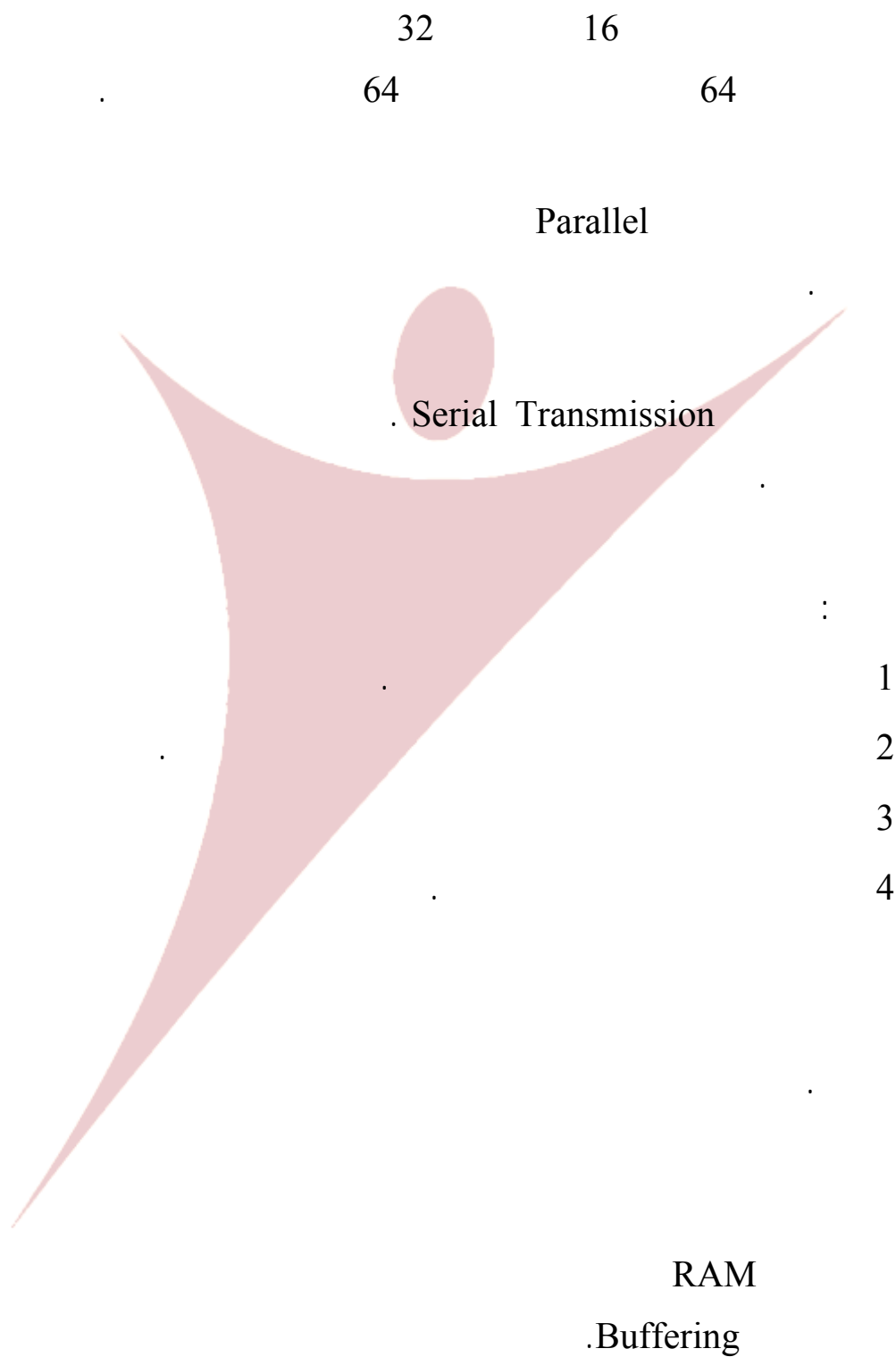
NIC



...

Expansion Slot







(Industry Standard Architecture) IBM PC XT, AT				ISA
8	16	8	ISA	
1988	IBM	(Micro Channel Architecture)	32 16	MCA
1988	NEC HP Compaq	(Extended Industry Standard Architecture)	33 32	
		IS		EISA
Intel		(Peripheral Component Interconnect)		
	132		32 1992	PCI

Plug and Play

Interrupt Request (IRQ) Lines  
Levels



EGA/VGA	9	2
COM1, COM3	4	
Floppy Disk Controller	6	
Parallel Port	7	
Real -Time Clock	8	
.	12	
Math Coprocessor	13	
.	14	

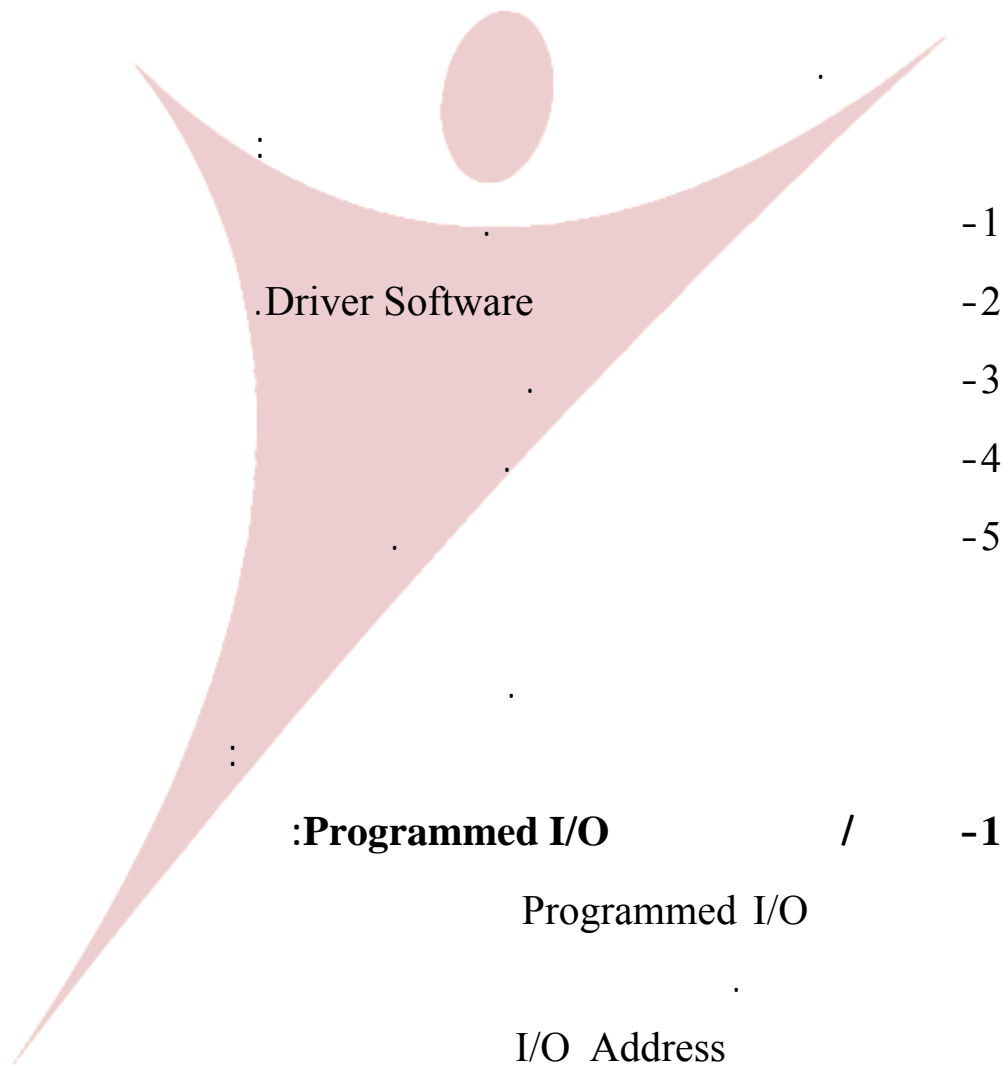
IRQ5    IRQ3

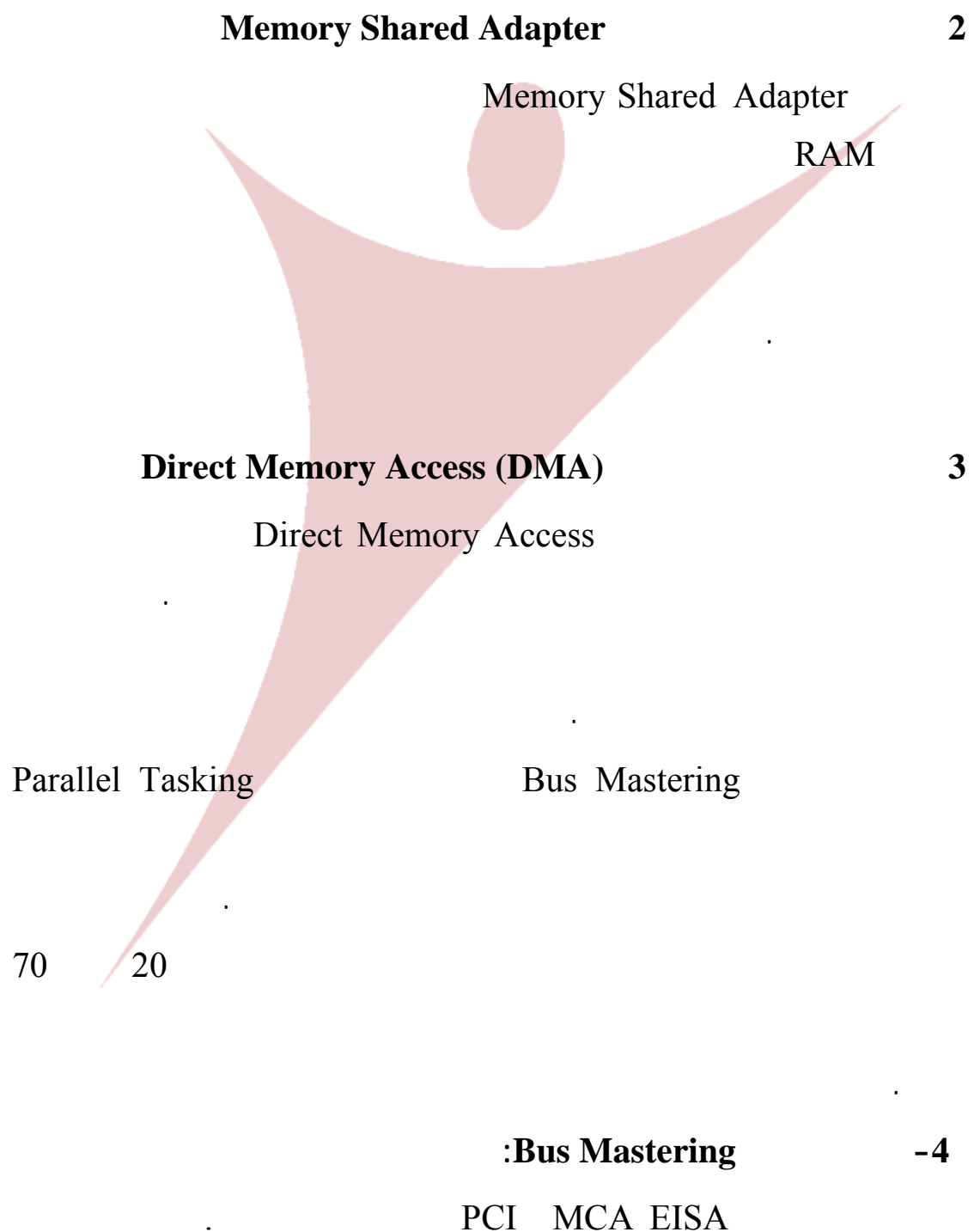
Input Output I/O Port Base

Base I/O

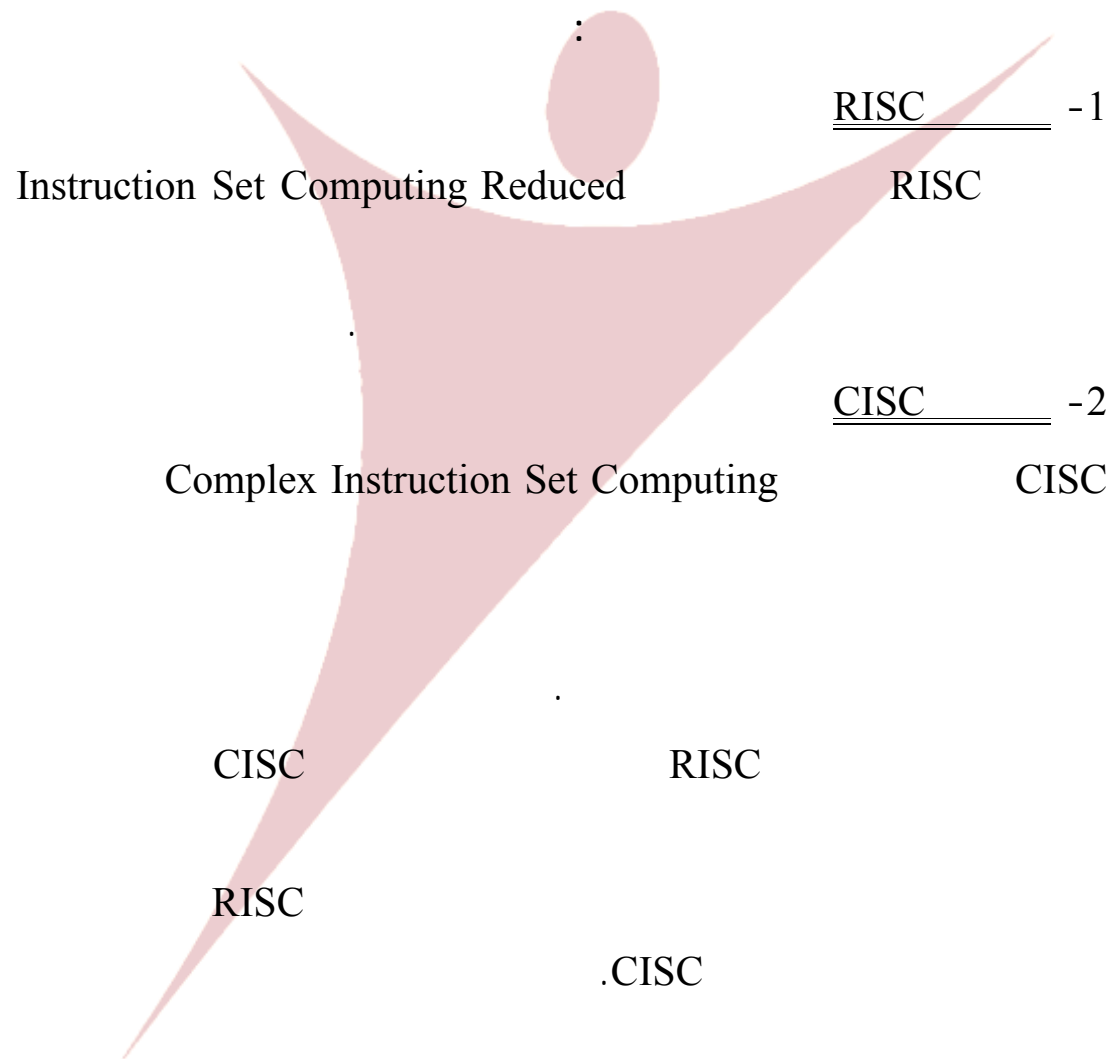
Port  
Hexadecimal format  
Port

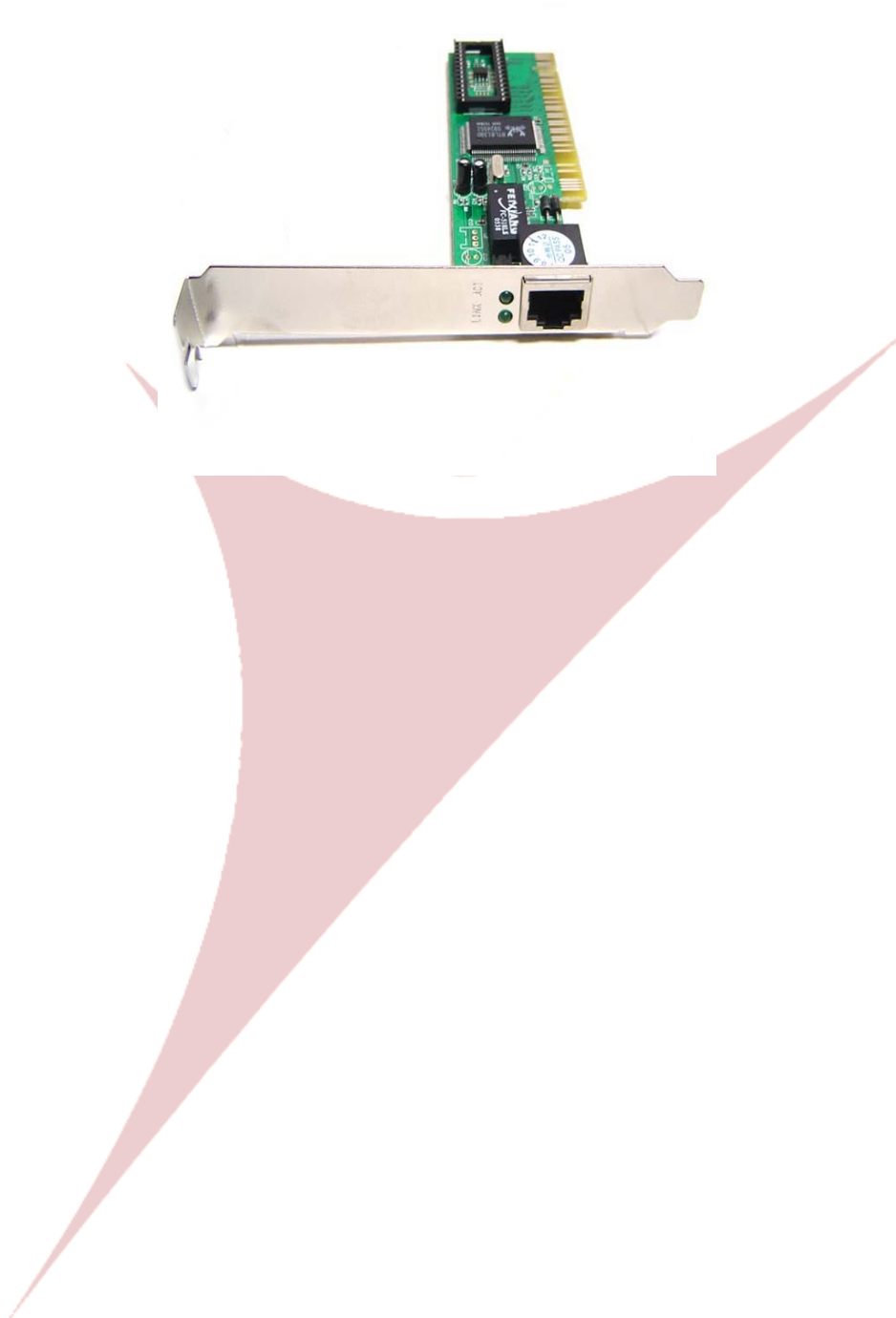
to 30F 300  
to 31F 310

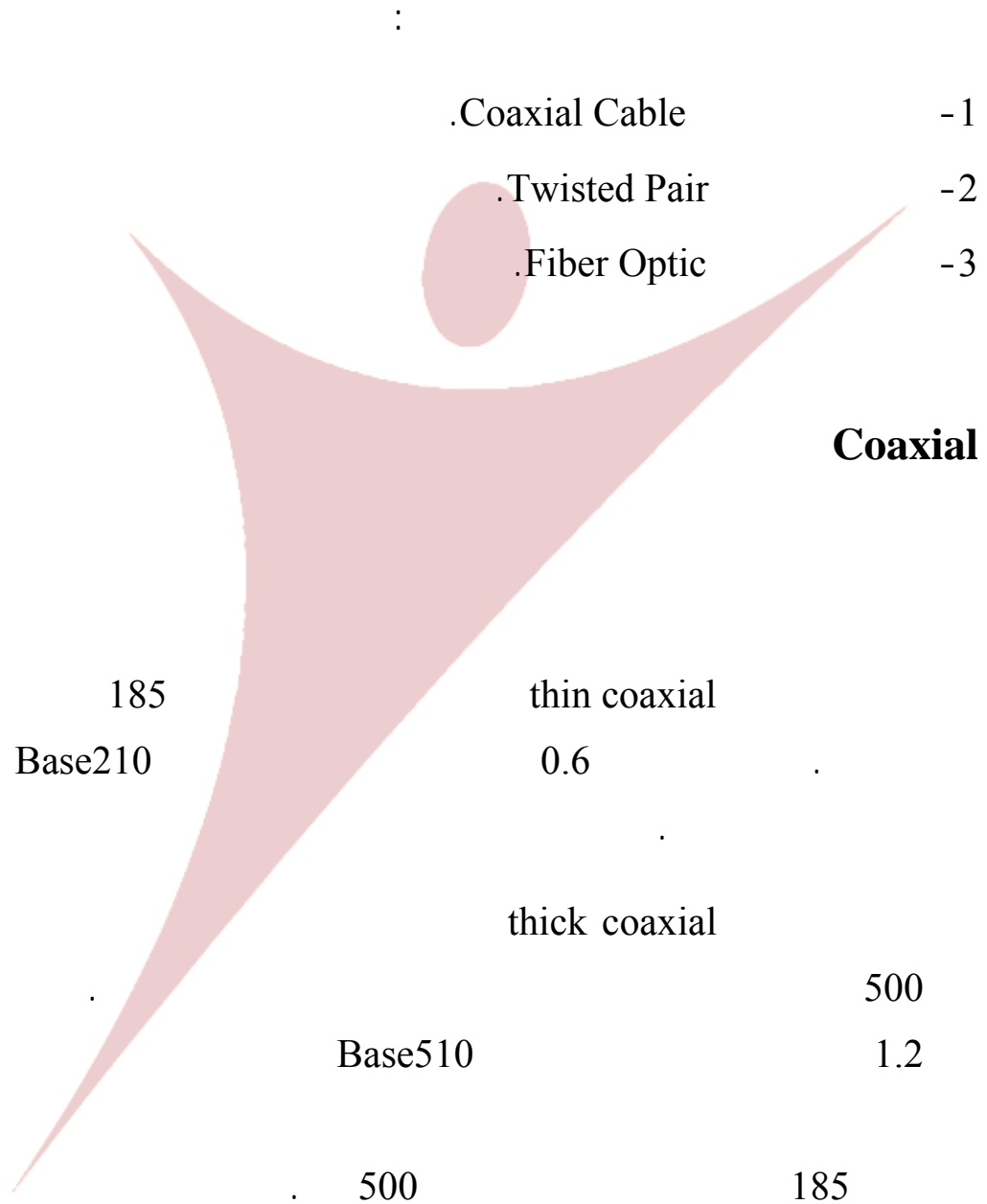




## Driver Network Card









## BNC

RG-11	RG-8 (	)	50 -1
		.(	)
		RG-58	50 -2
		RG-59	75 -3
ARCnet.		RG-62	93 -4

BNC (British Naval Connectors)

:

BNC

BNC cable connector.

BNC T connector.

BNC barrel connector.

BNC terminator.

## Twisted pair



STP

UTP

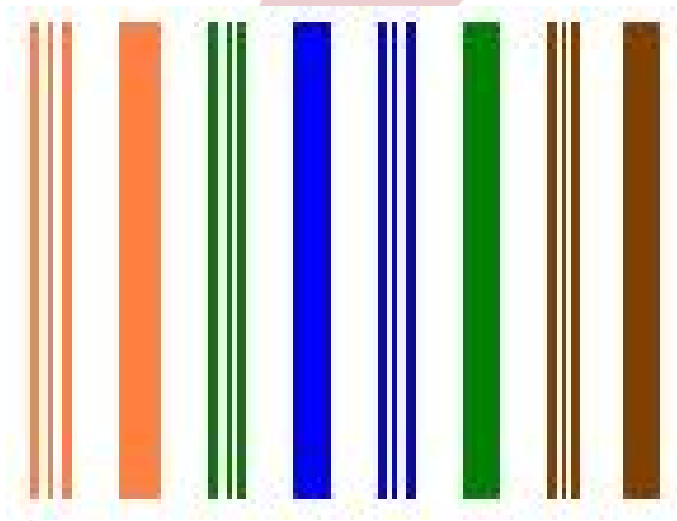


RJ-45

HUP

1

3



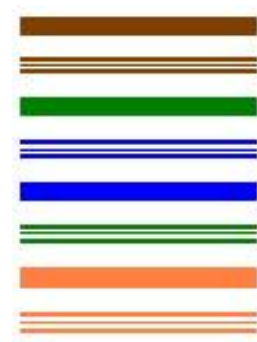
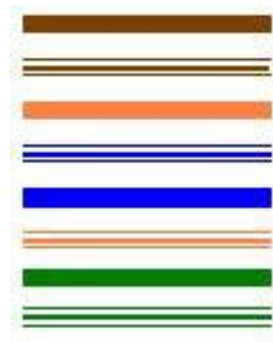
RJ-45

1





:



: Fiber optic



:

- 
- 
- 
- 

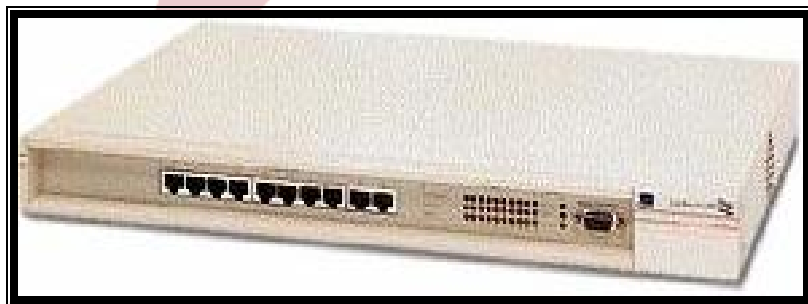
2

1

**: HUB**

**: Switch**

HUB



**: Repeaters**

**: Bridges**

**: Routers**

IP

<b>BNC</b> <b>BNC</b>	
<b>BNC</b>	
<b>BNC</b>	
<b>Coaxial</b>	
<b>BNC</b>	
<b>RJ-45</b> <b>BNC</b>	

.	
<b>RJ-45</b>	
<b>RJ-45</b>	
<b>RJ-45</b>	
( )	
<b>HUB</b>	

<b>RJ-45</b>	
<b>RJ-45</b>	
	
<b>.RJ-45      UTP</b>	

## مهمة دراسية:

:

.

:

8

:

(HUB)

1

2

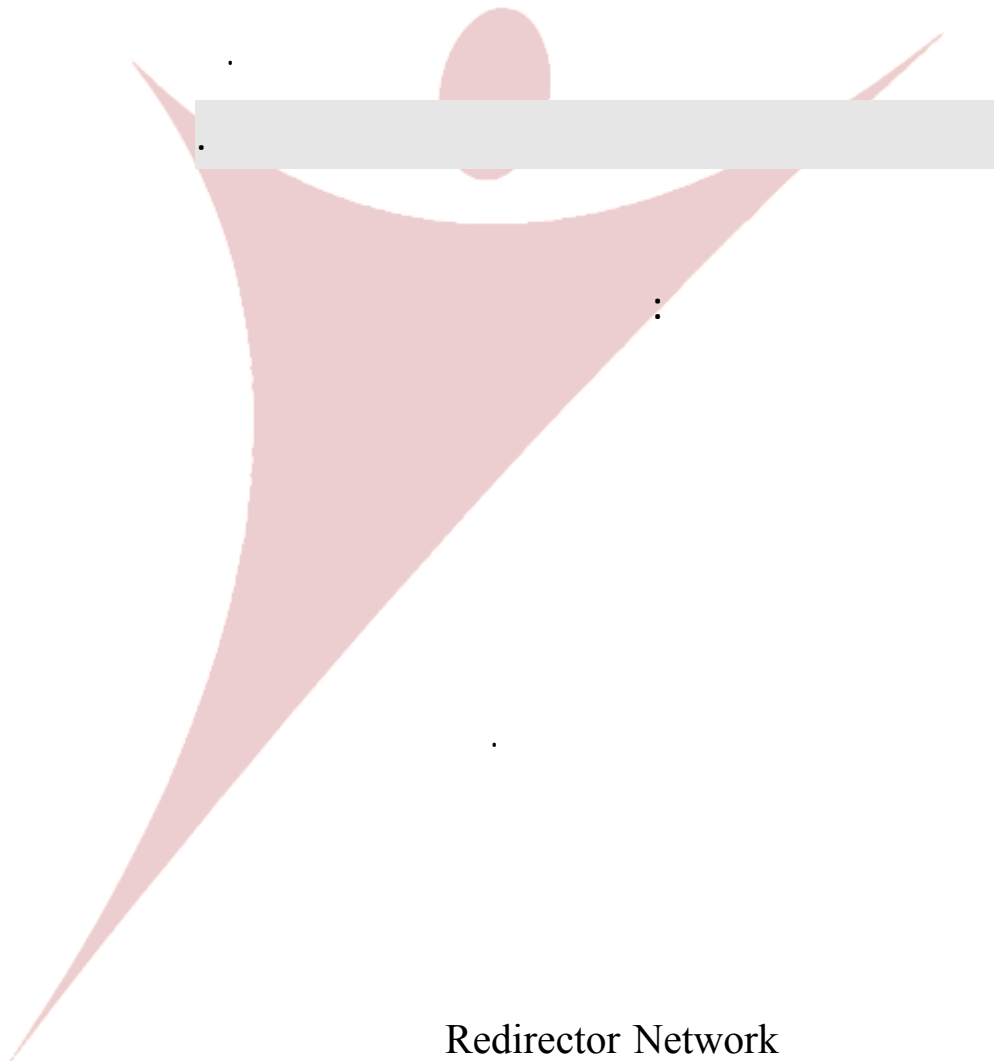
3

4

5



## القسم الرابع: مشغل الشبكة Network Driver



Redirector Network  
Input/Output (I/O)

.Network Driver Interface

:

- ❖ Network Driver Interface Specification (NDIS) .
- ❖ Open Data-Link Interface (ODI).

. NDIS

.ODI

Novell NetWare

NDIS

ODI

**NDIS**

:

1

2

3

**NDIS**

1

2

Input/Output

3

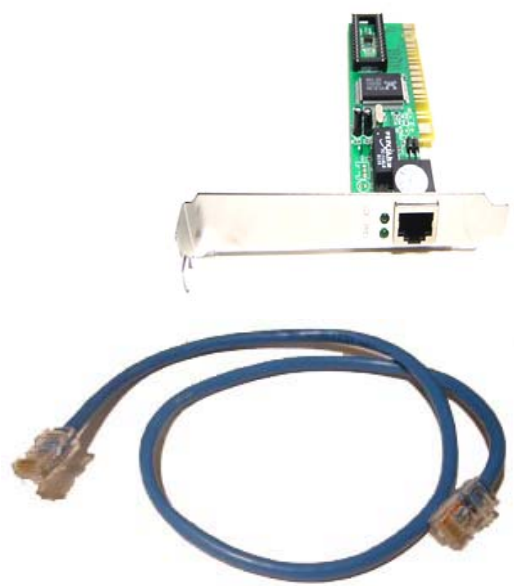
Interrupts

4

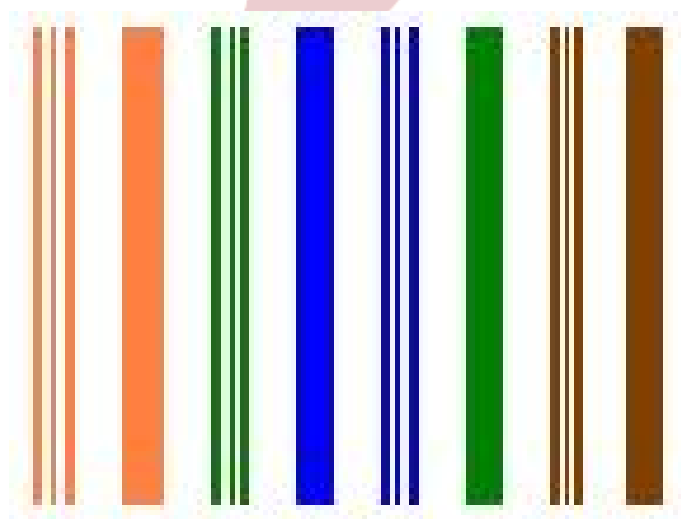
5

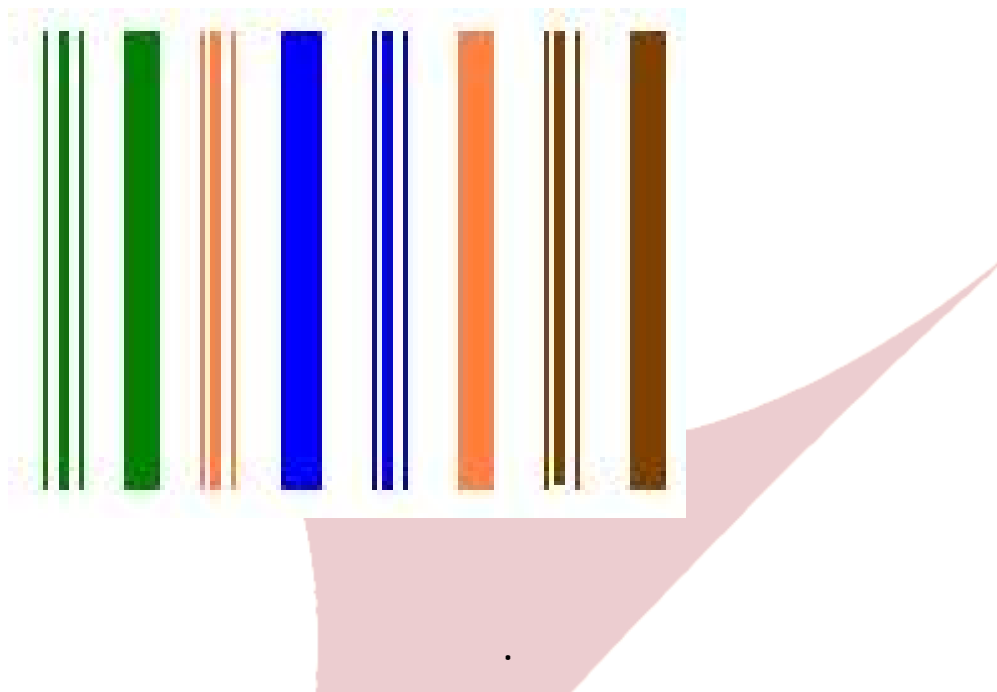
## القسم الخامس : إعداد شبكة بين جهازين في Windows Xp

XP



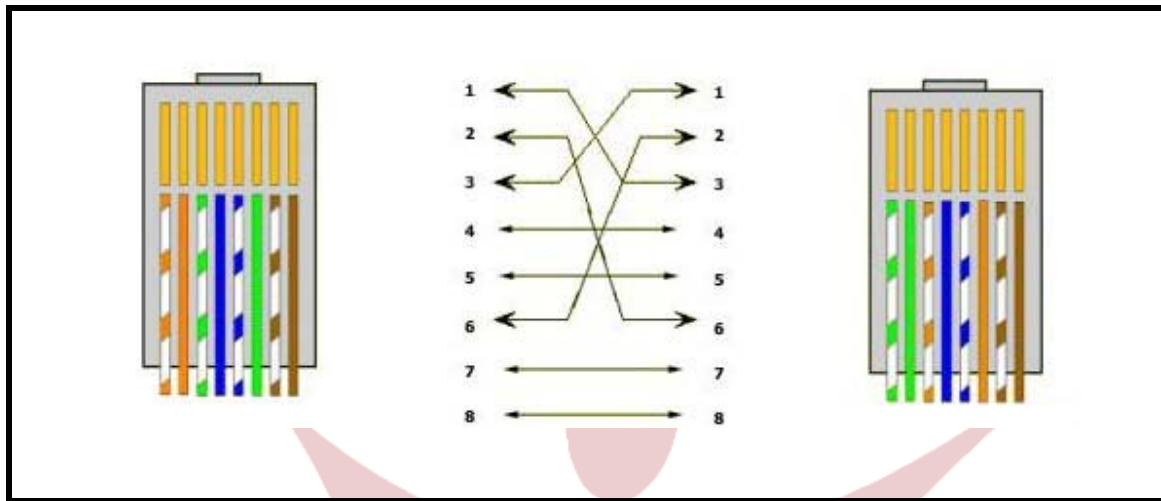
Cable





3	1
6	2
1	3
4	4
5	5
2	6
7	7
8	8

:



:

: RJ



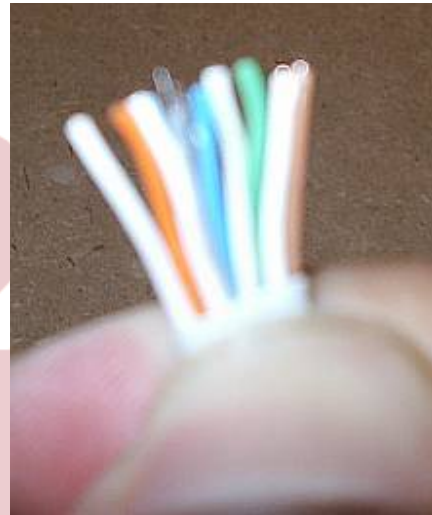
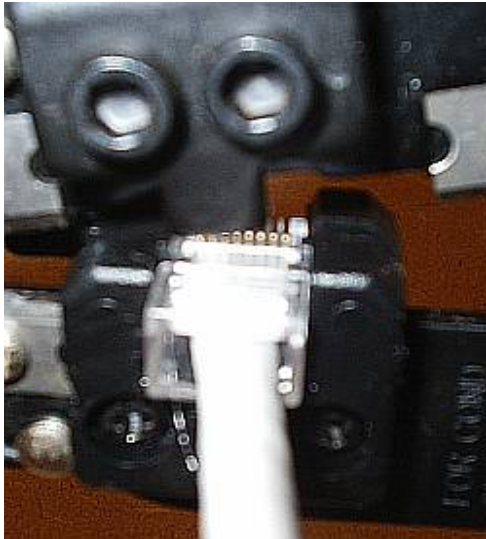
**: RJ-45**



•

## RJ-45

:



:

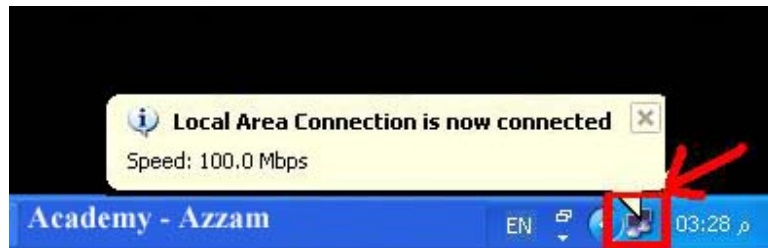


: PCI



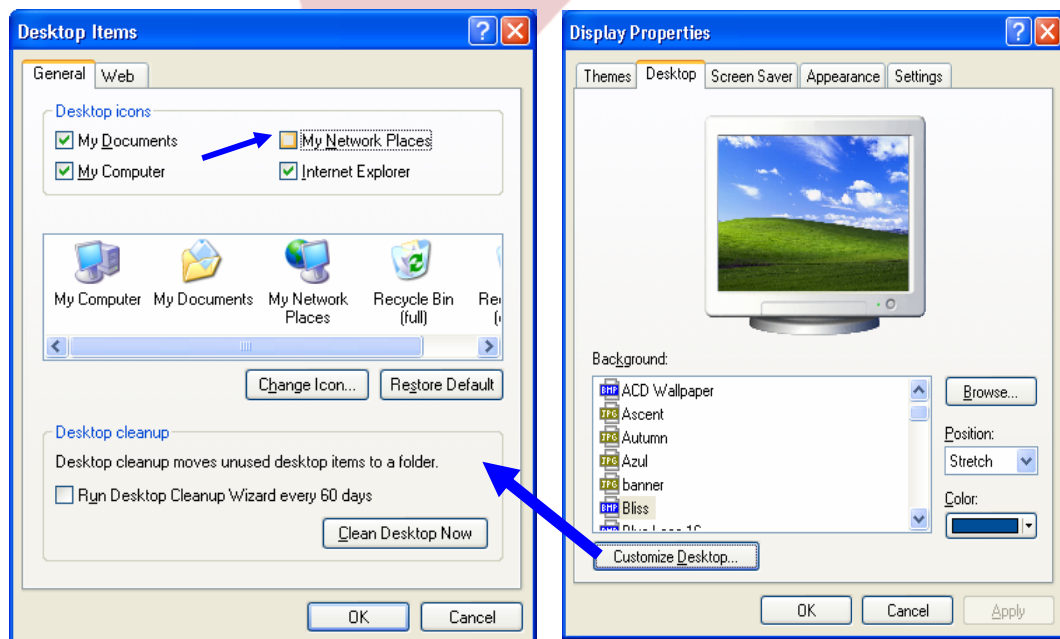
Cable



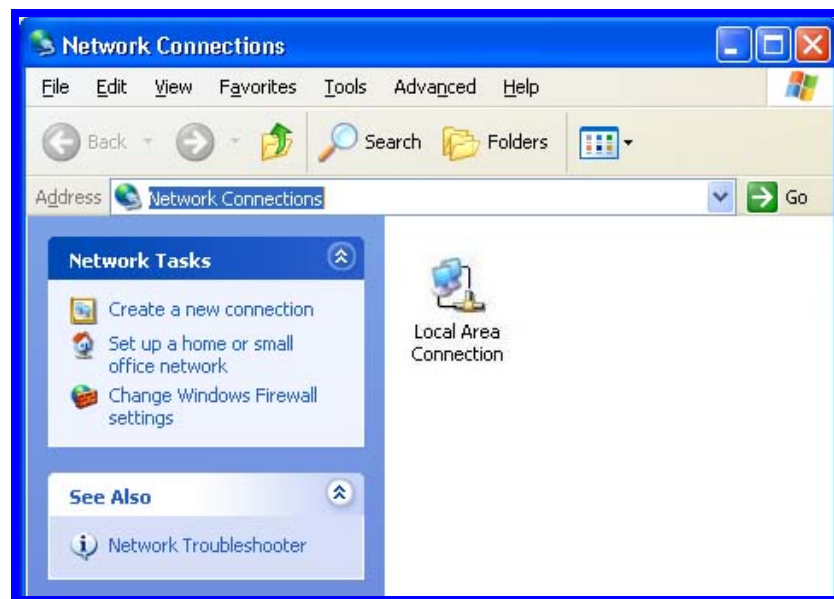


My Network Places

:

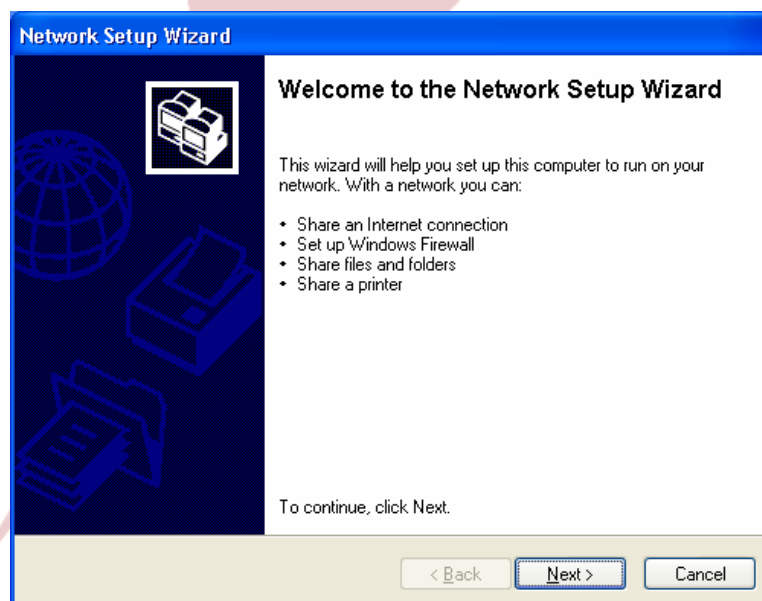


My Network Places

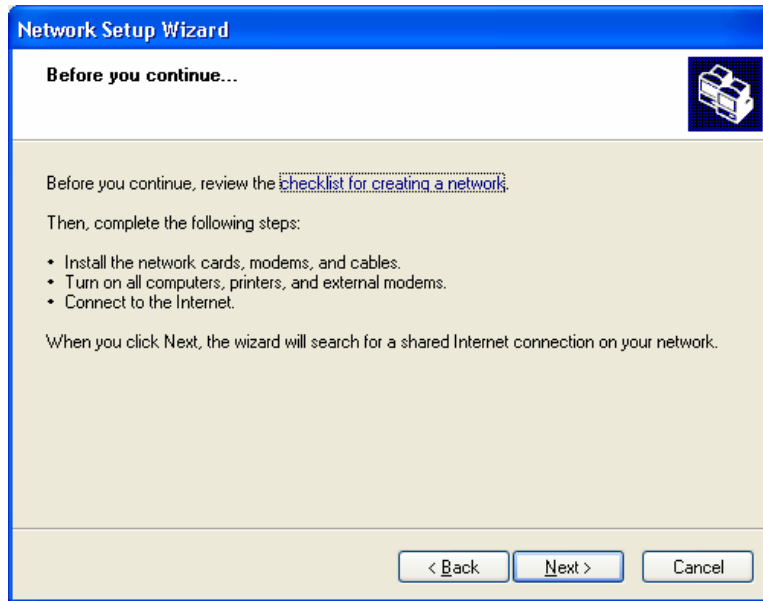


.Set Up a home or small office network

:



.Next



.Next



**Network Setup Wizard**

**Give this computer a description and name.**

Computer description:   
Examples: Family Room Computer or Monica's Computer

Computer name:   
Examples: FAMILY or MONICA

The current computer name is AZZAM-0DDEB8804.

Learn more about [computer names and descriptions](#).

< Back   Next >   Cancel

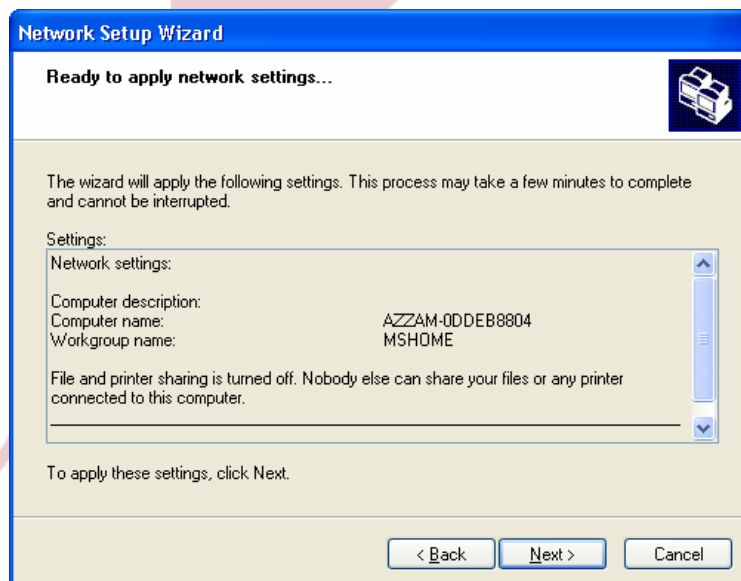
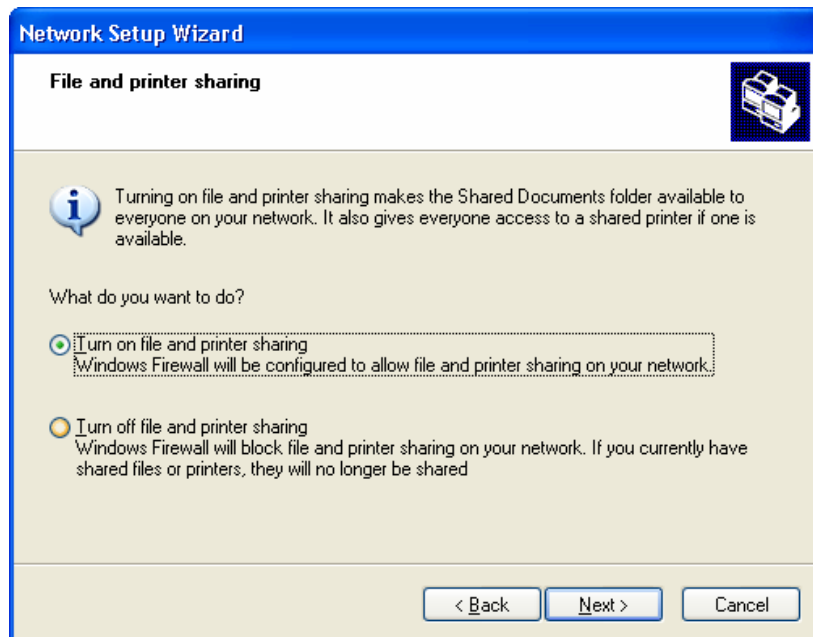
**Network Setup Wizard**

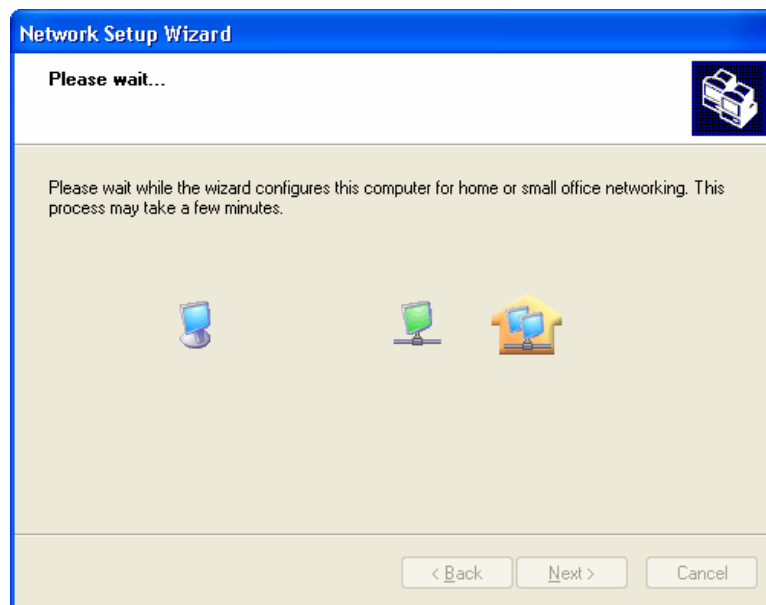
**Name your network.**

Name your network by specifying a workgroup name below. All computers on your network should have the same workgroup name.

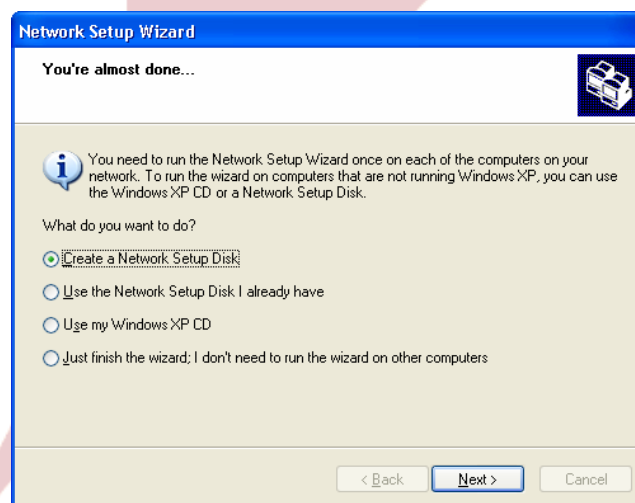
Workgroup name:   
Examples: HOME or OFFICE

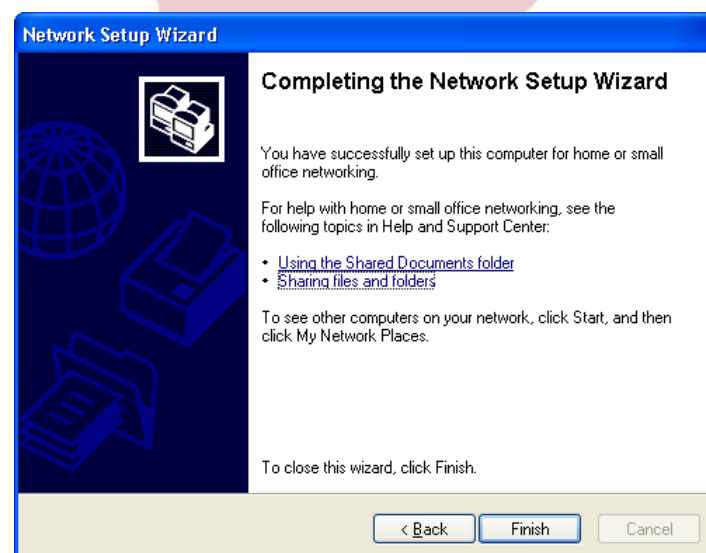
< Back   Next >   Cancel





..





.netsetup

## مهمة دراسية:

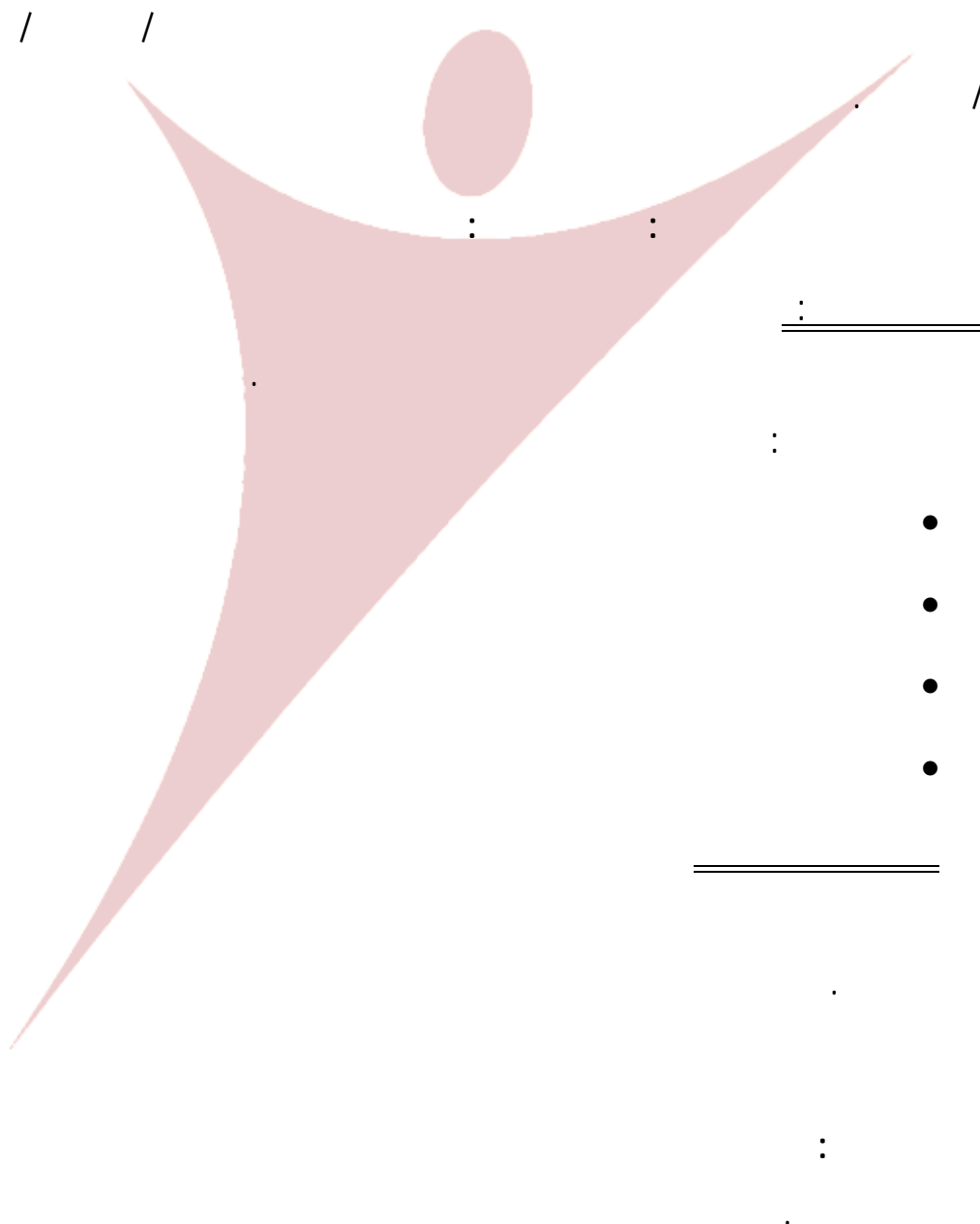
:

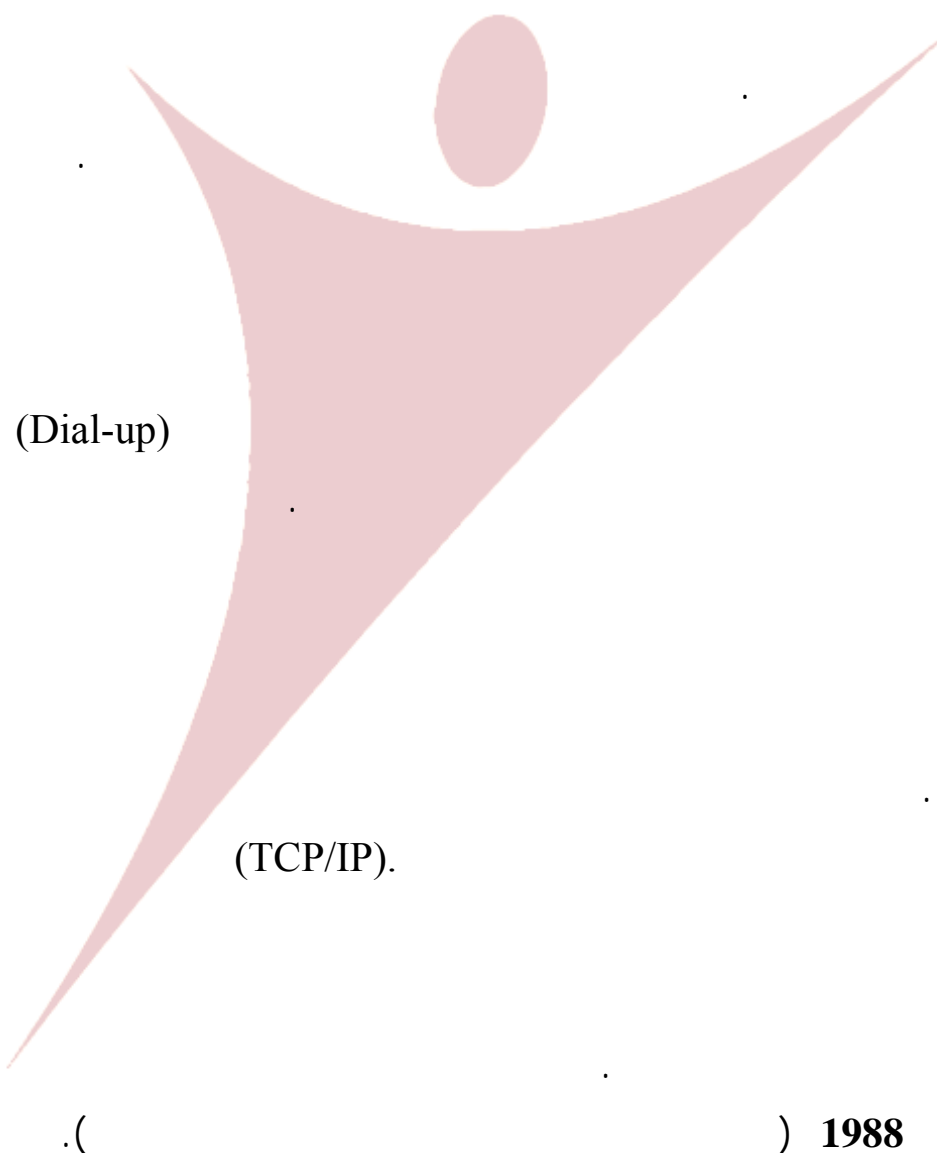
**Windows Xp**

.ADSL



## القسم السادس: أمن الشبكات



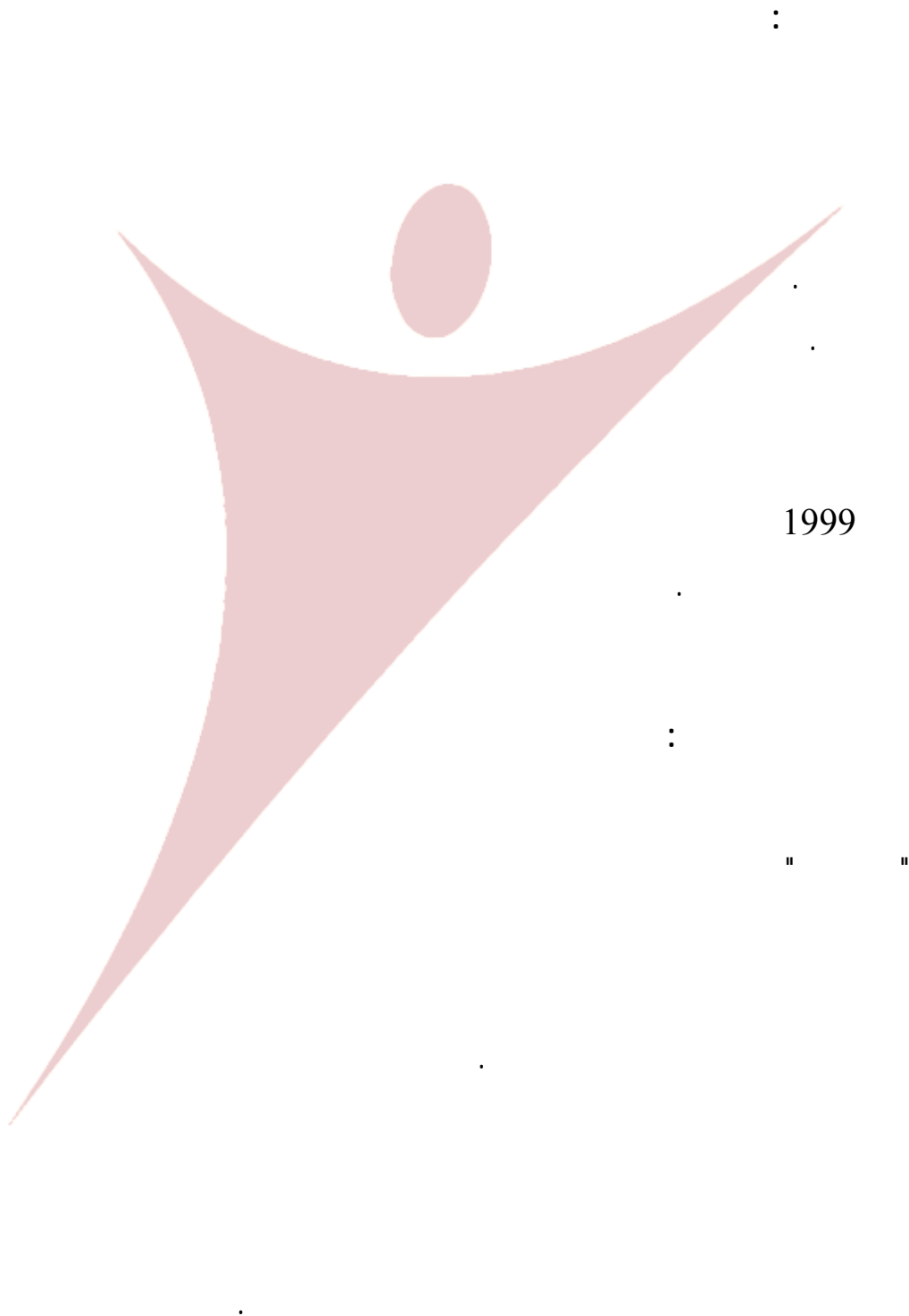


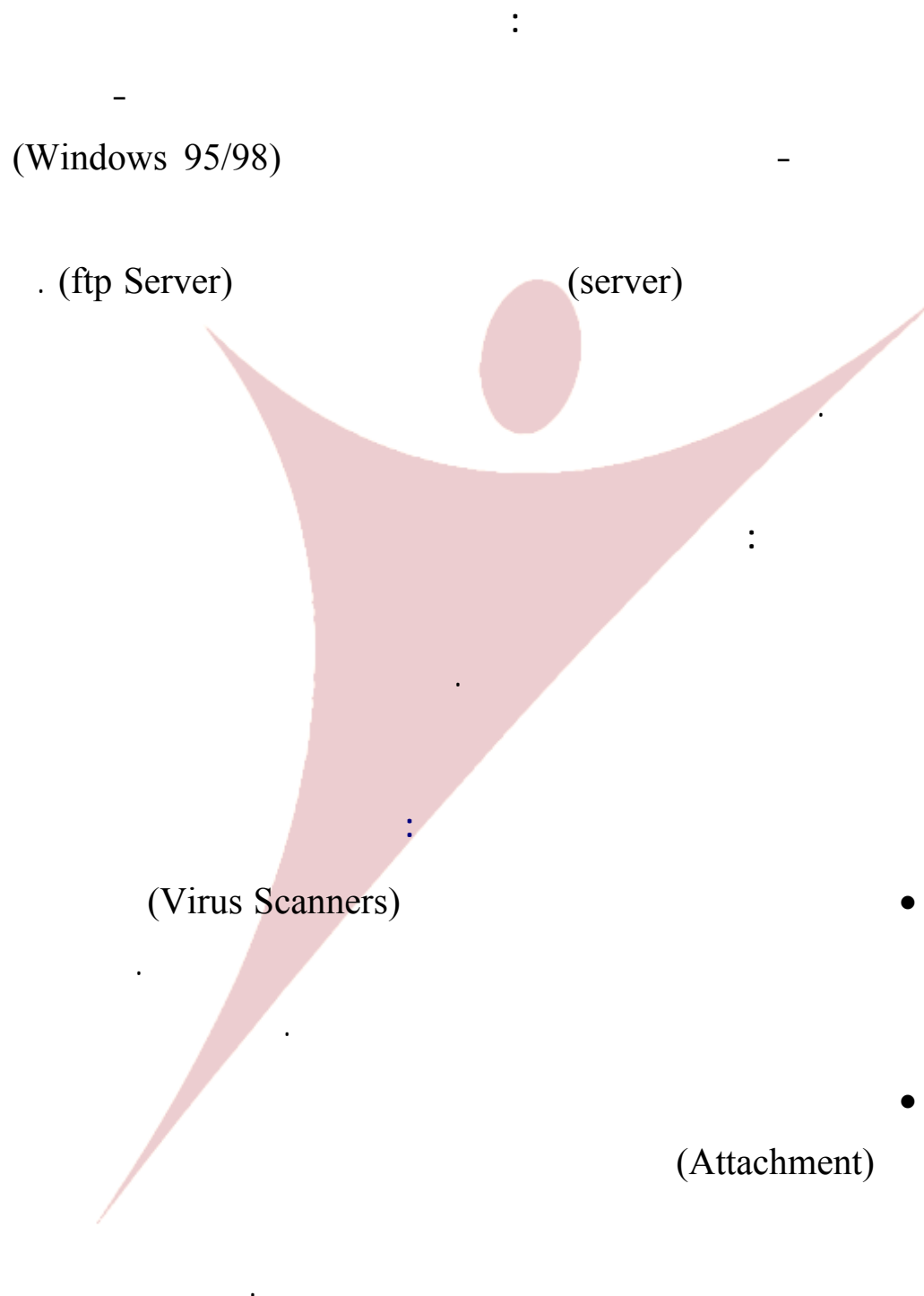
%10

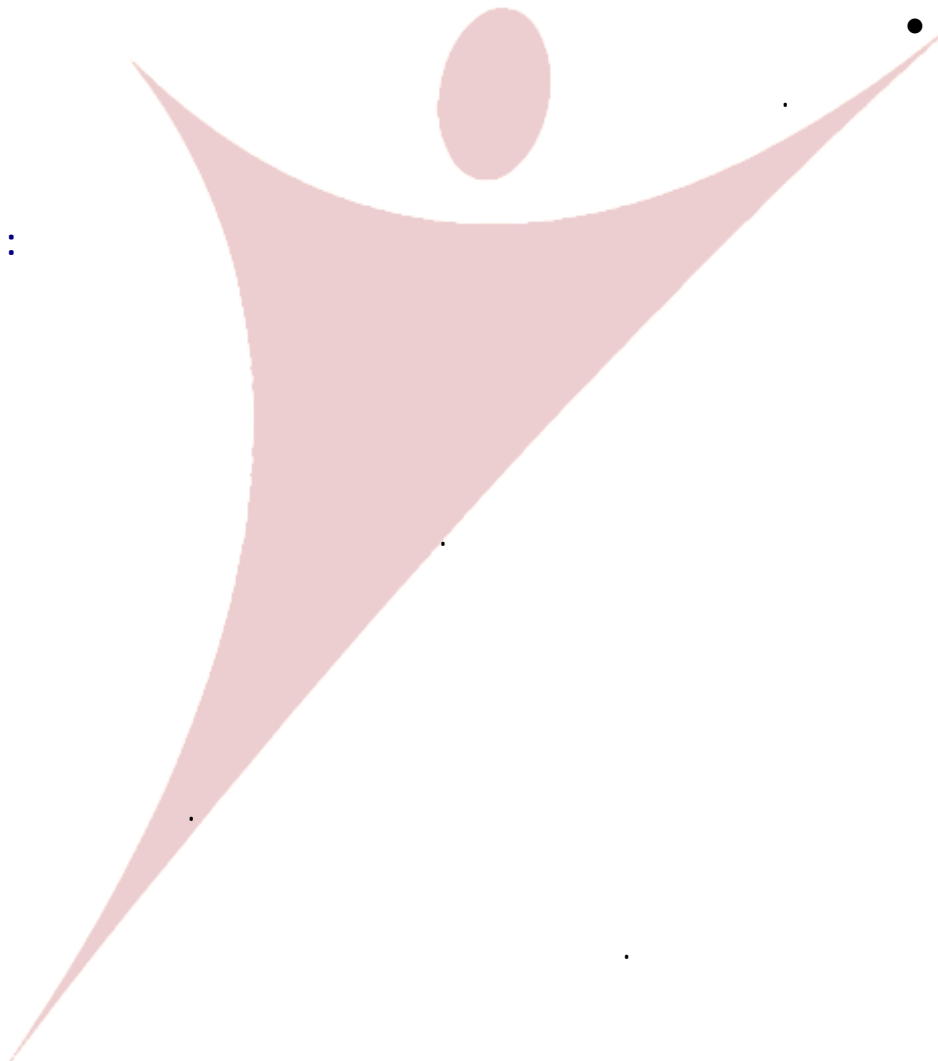
60

:



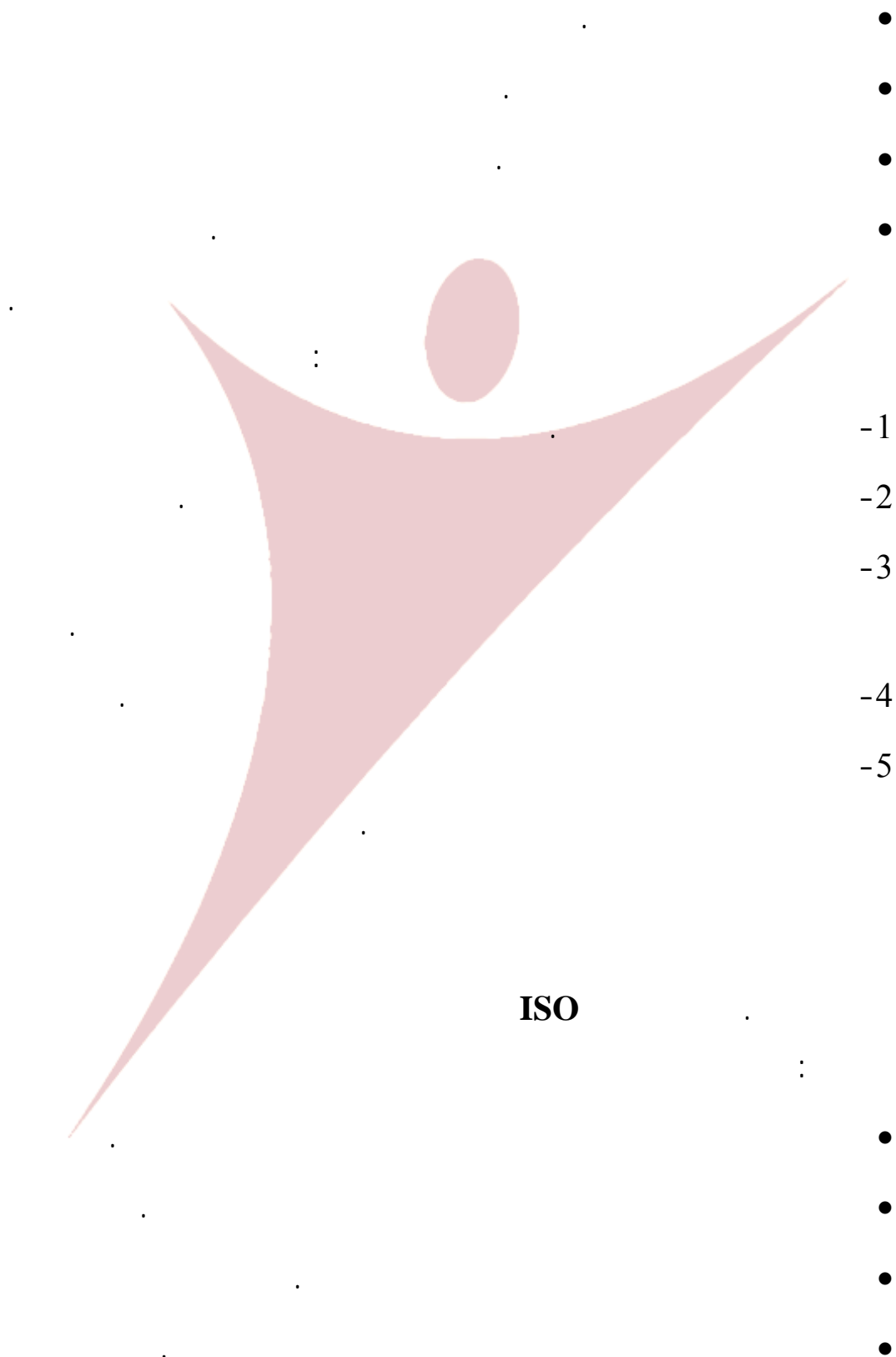




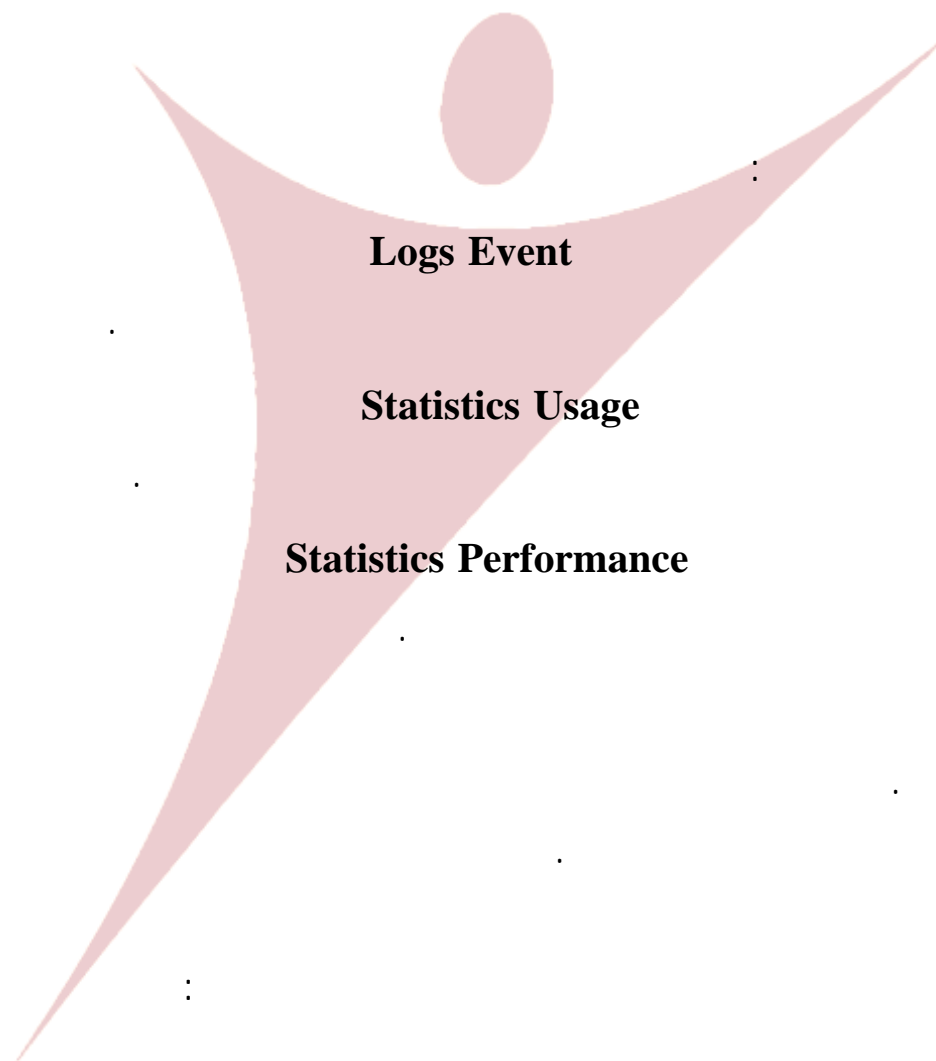


## القسم السابع: مشاكل الشبكات









**Logs Event**

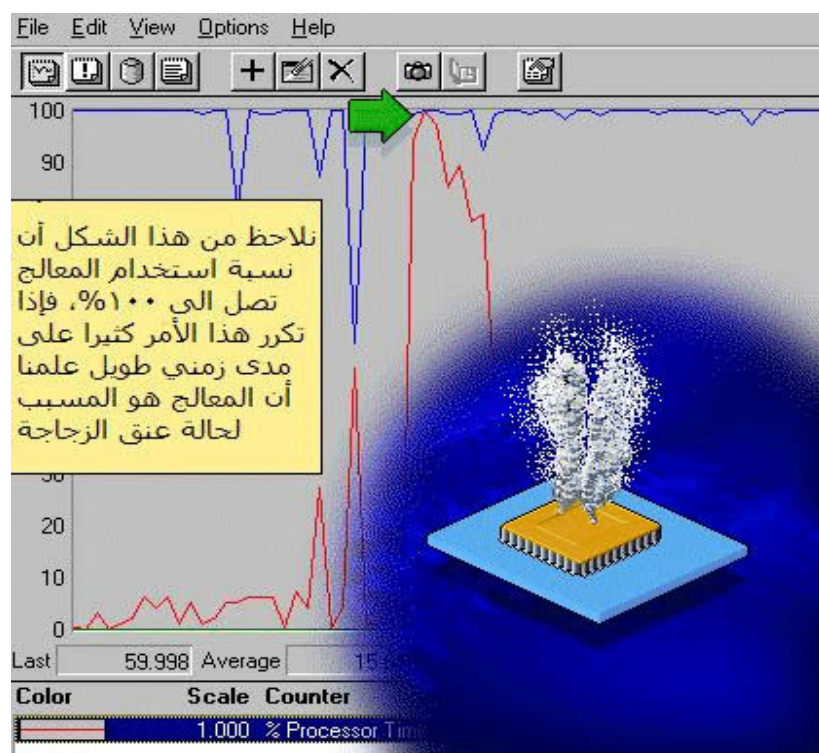
**Statistics Usage**

**Statistics Performance**

1

2

3



• IBM's Netview .sit

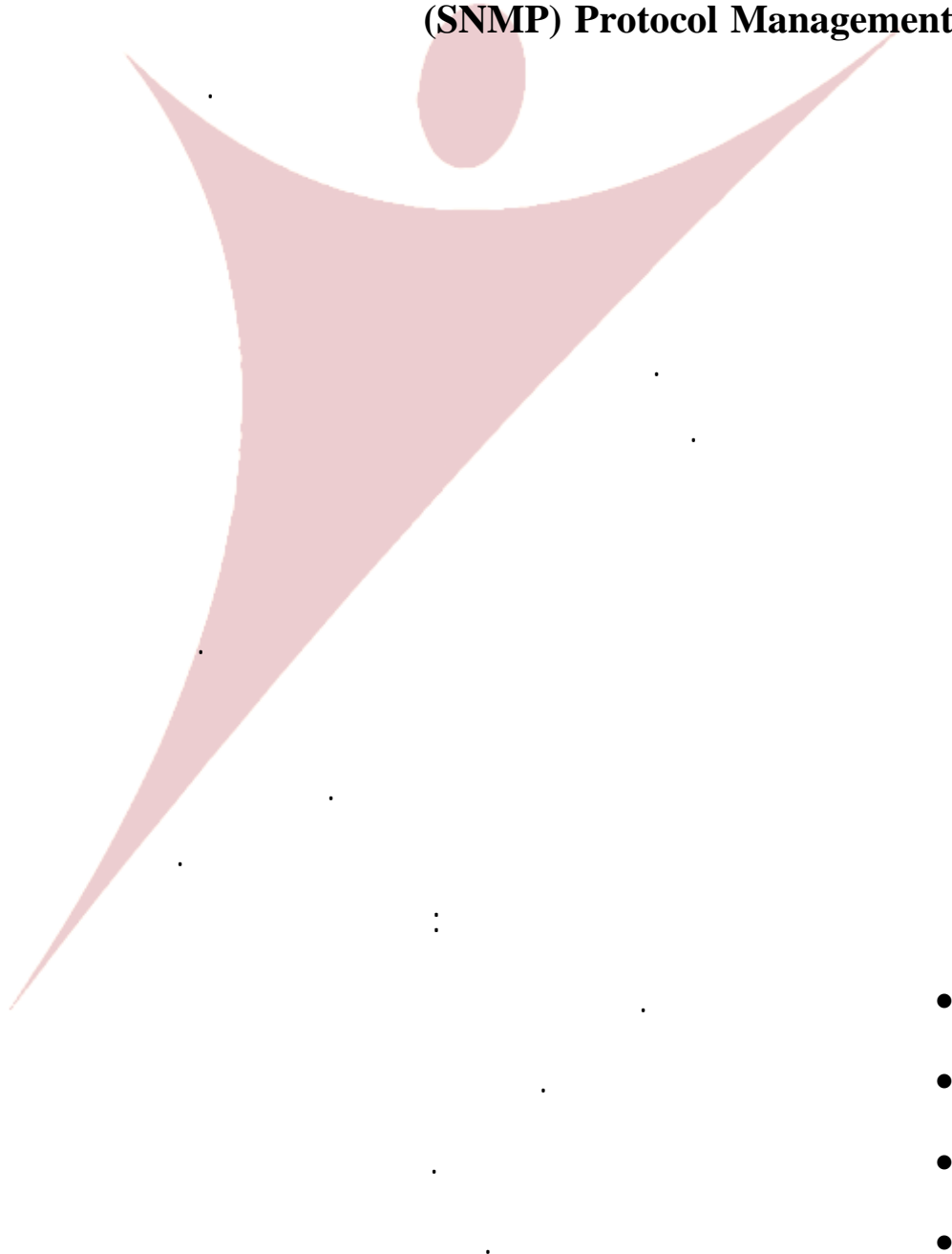
• SunNet Manager .

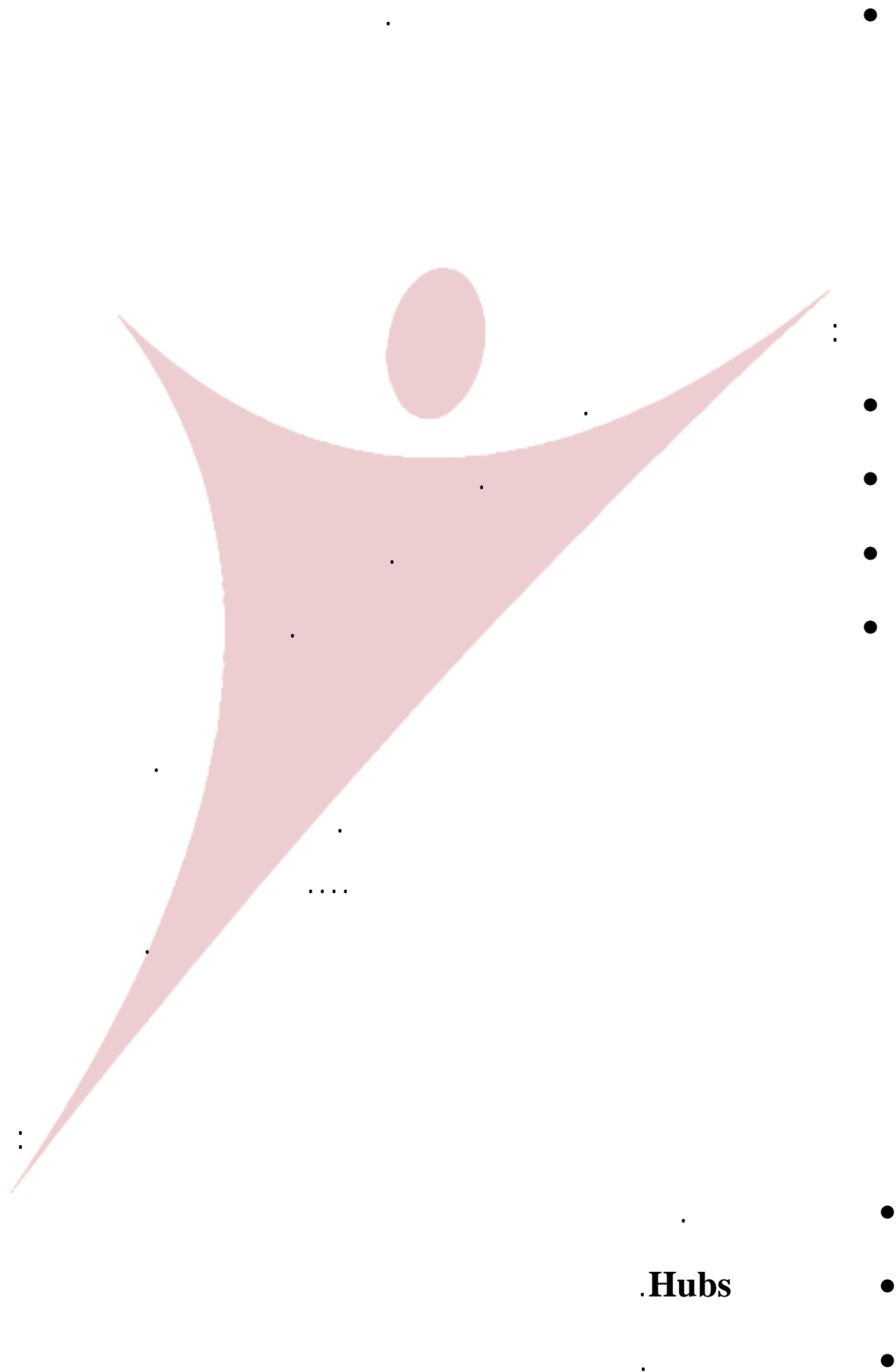
**.Manager Enterprise Spectrum •**

**.CiscoWorks •**

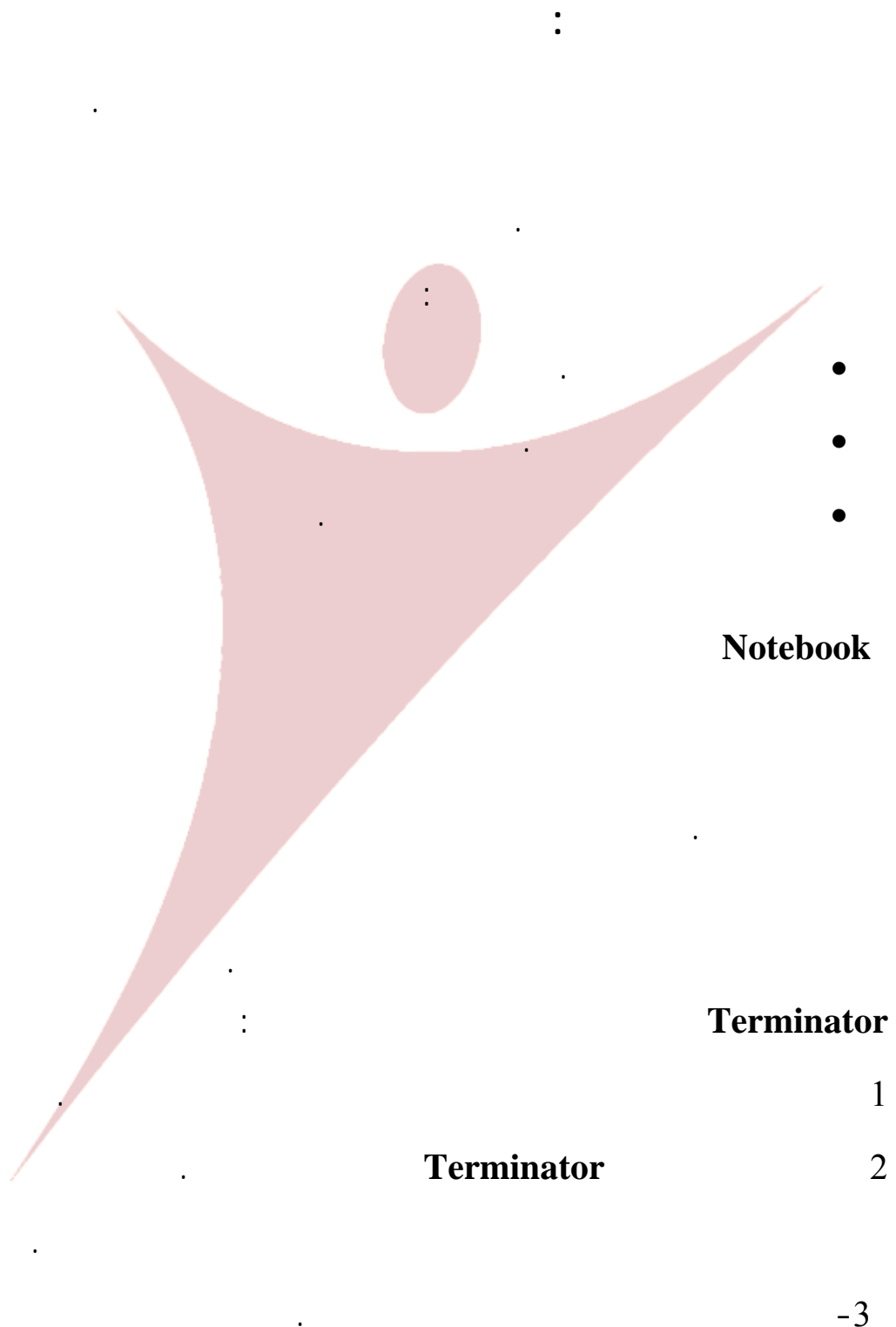
**Network Simple**

**(SNMP) Protocol Management**









## Domain Time

**Analyzer Protocol**

**(TDR) Reflectometer**

**BNC, AUI,)**

**(RJ-45**



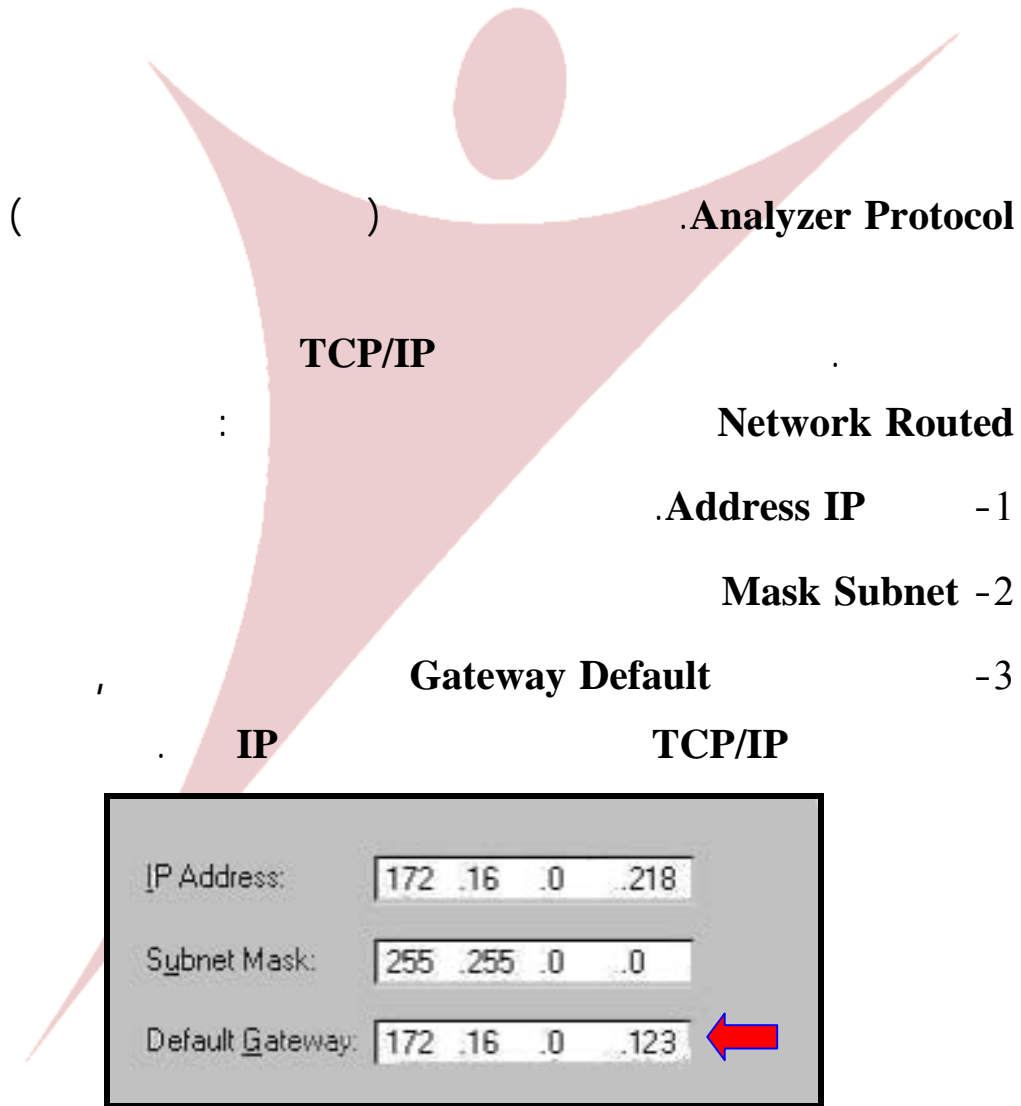


**.AppleTalk DECnet IPX/SPX**

) **NWLink**

**SAP - Protocol Advertising Service (**

**8**



**32 IP**



: IP

ID Network The :

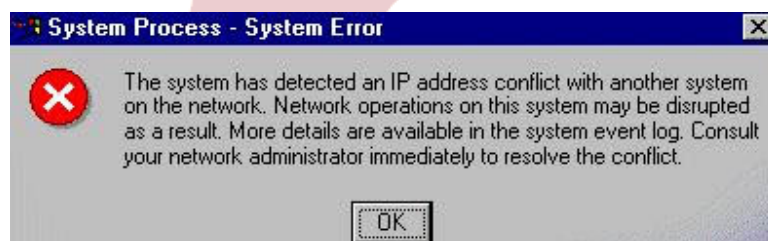
IP

: ID Host The

IP

IP

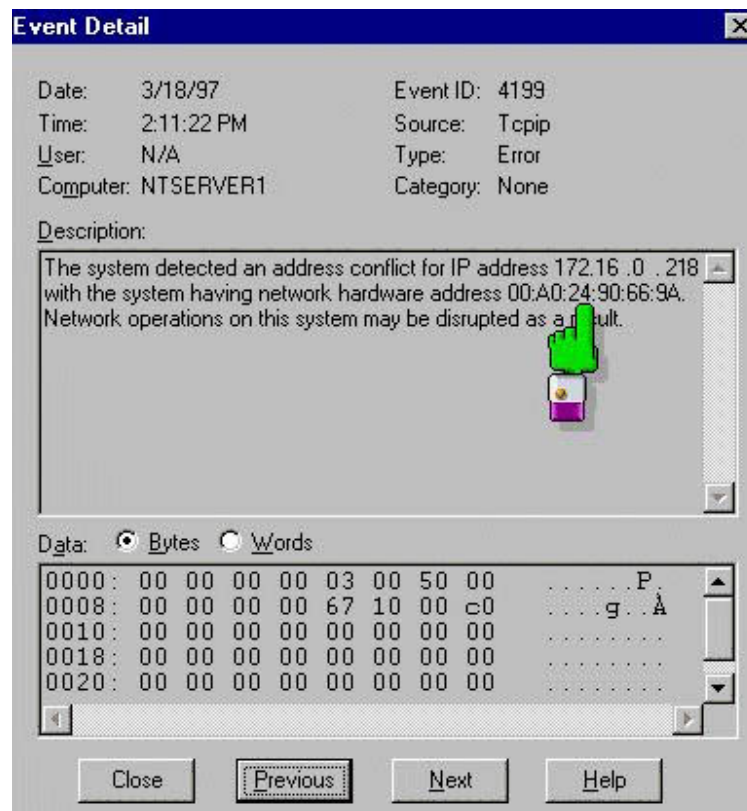
(NT Windows



Viewer Event

NT Windows

IP

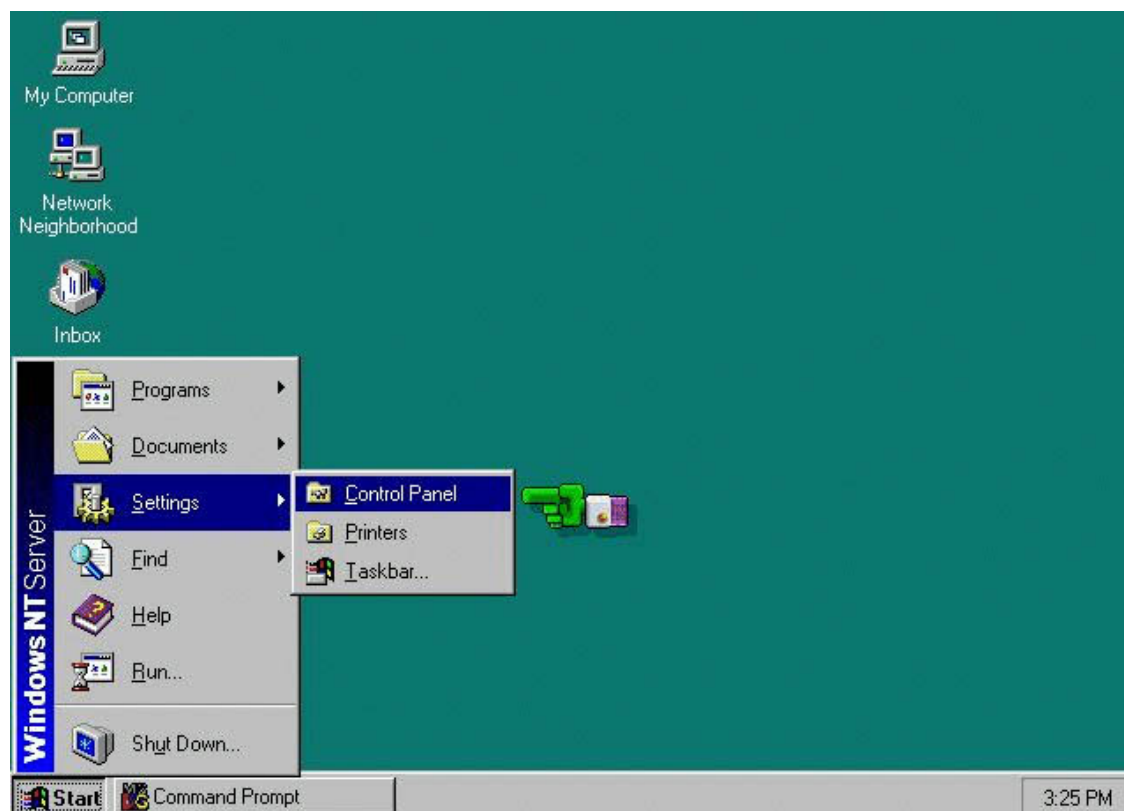


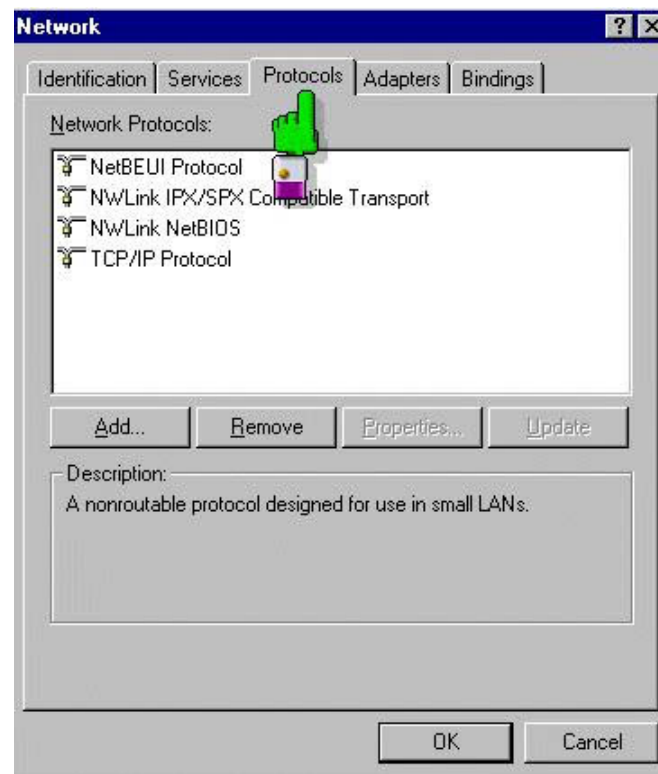
Panel Control

Settings

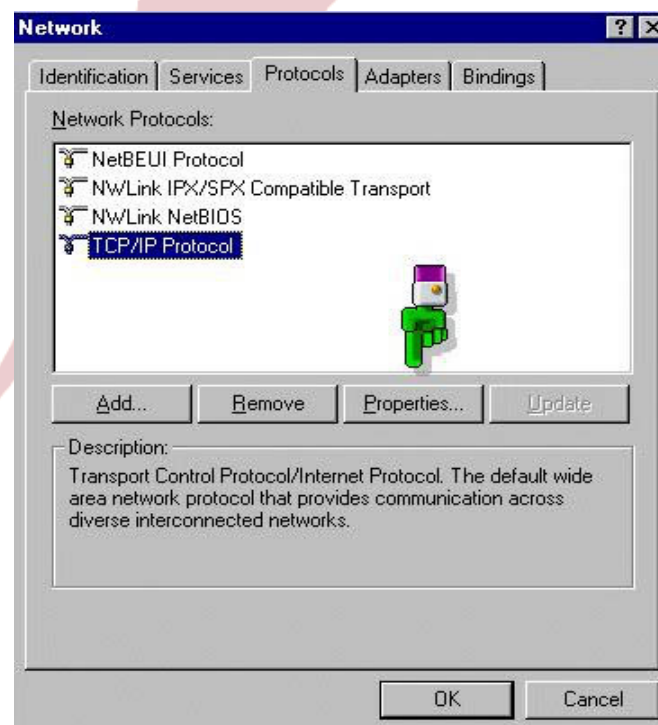
IP  
Start

- 1

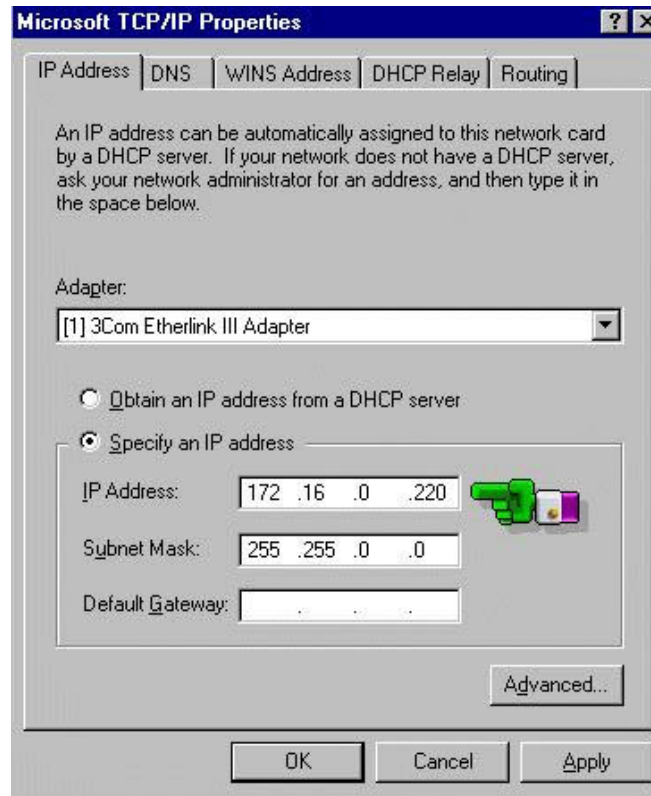
**Panel Control****Networks****-2****Protocols****Networks****-3**

**Properties****TCP/IP**

-4

**OK****IP**

-5



**.Subnets**

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- 
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- 
- 

**.ID Network**

**Subnets**

**Masking Subnet**

**Mask Subnet**

**.Subnets**

**Addresses IP**

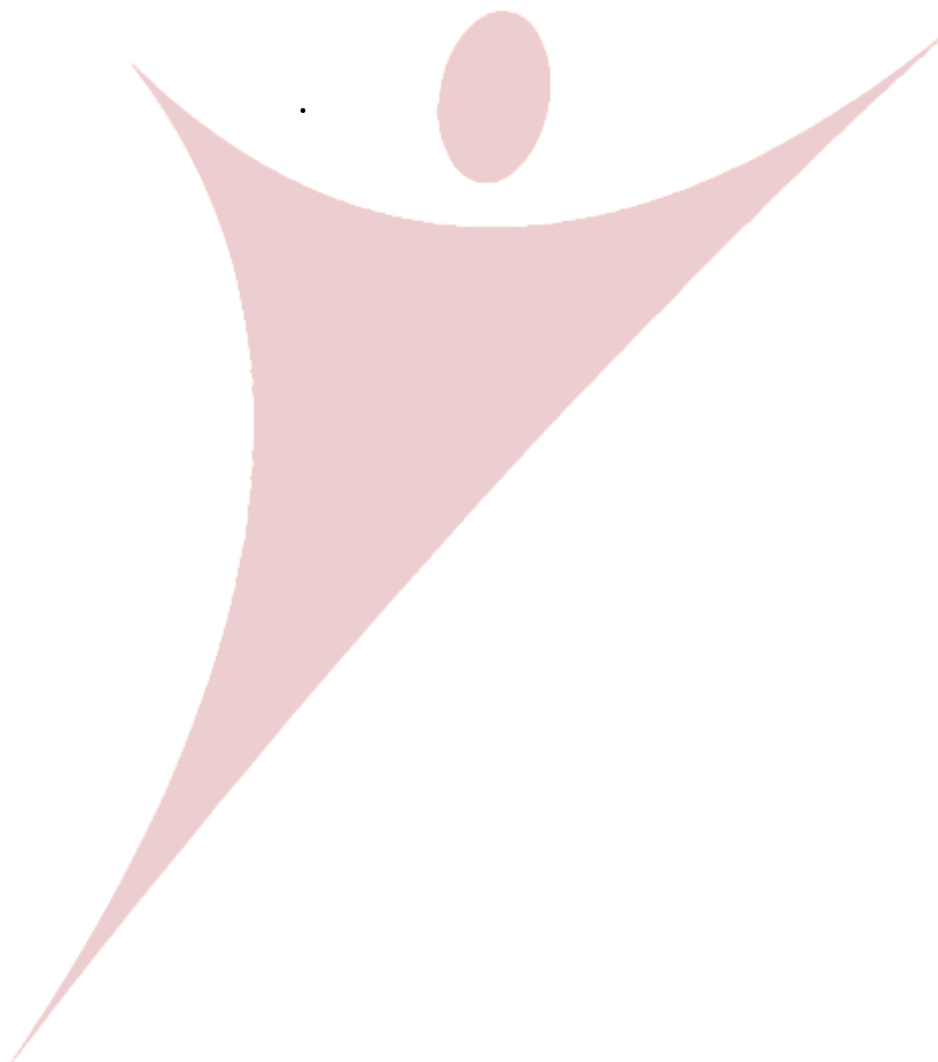
**Address IP**

**32**



## مهمة دراسية:

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مع تمنياتنا لكم بالنجاح والنجاة الكريمة

