Suez Canal University
Faculty Of Engineering
Electrical Engineering Department

Computer Networks

‘’ Faculty Of Engineering Network Project’’

Using Packet Tracer

Under The Supervision Of

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Content:

1. What is Packet Tracer?

Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated commandline interface. Packet Tracer makes use of a drag-and-drop user interface, allowing users to add and remove simulated network devices as they see fit.

1.1 Router

A router is a device like a switch that routes data packets based on their IP addresses. The router is mainly a Network Layer device. Routers normally connect LANs and WANs together and have a dynamically updating routing table based on which they make decisions on routing the data packets. Router divides broadcast domains of hosts connected through it.

1.2 Switch

A network switch (also called switching hub, bridging hub, officially MAC bridge is networking hardware that connects devices on a computer network by using packet switching to receive and forward data to the destination device.

1.3 Network Packet

A network packet is a formatted unit of data carried by a packetswitched network. A packet consists of control information and user data, which is also known as the payload

1.4 Ethernet

This is the backbone of our network. It consists of the cabling and is typically able to transfer data at a rate of 100mb/s. It is a system for connecting a number of computer systems to form a local area network, with protocols to control the passing of information and to avoid simultaneous transmission by two or more systems.

1.5 Internet Protocol

Internet Protocol (IP) is one of the fundamental protocols that allow the internet to work. IP addresses are a unique set of numbers on each network, and they allow machines to address each other across a network. It is implemented on the internet layer in the IP/TCP model.

2. Faculty of Engineering Network

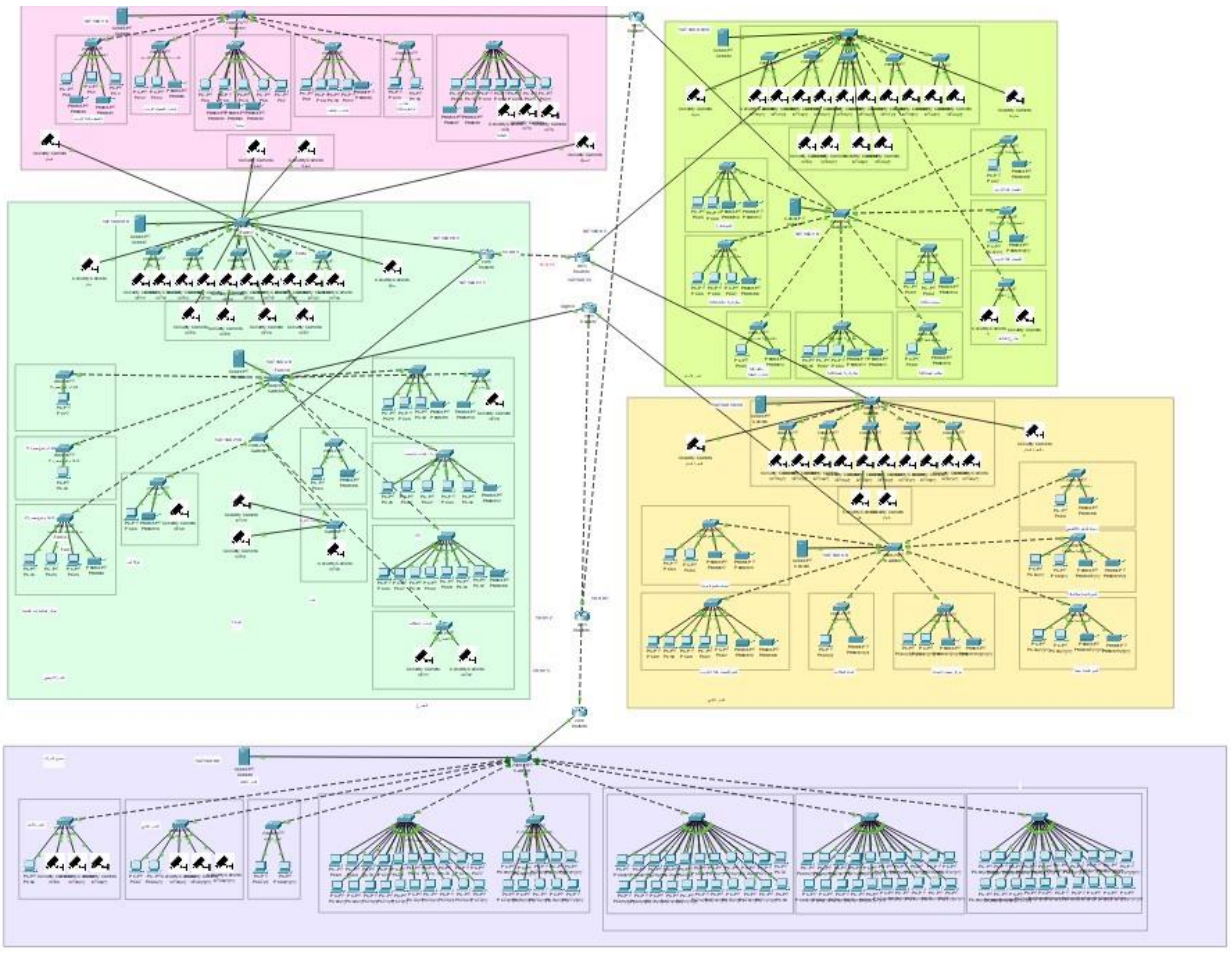
The network is divided into 2 areas:

1. Main building Area (مبنى الكلية)

The Main building Area is further divided into 4 floors

2. Workshop Area (منطقة الورش)

الكلية



الور ش

2.1 Basement

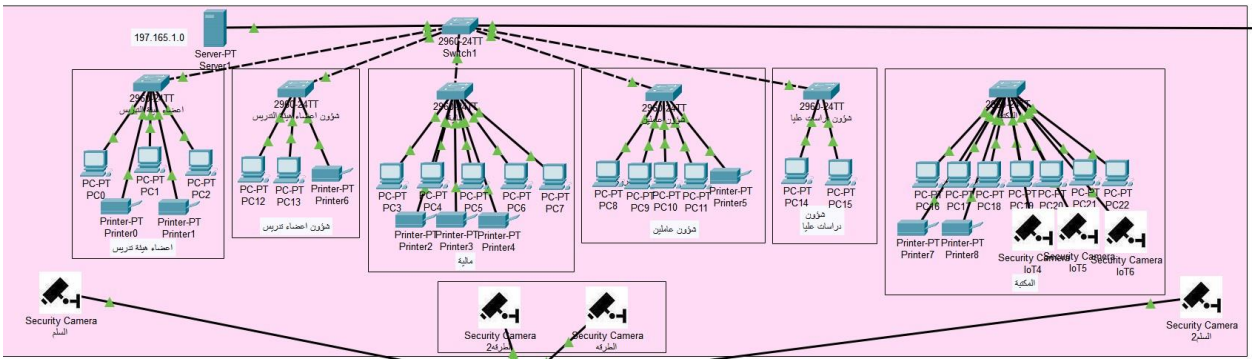
Room	Computers	Cameras	Printer
السلم اليمين	0	1	0
السلم اليسار	0	1	0
المكتبة	7	3	2
شؤون درسات عليا	2	0	0
شؤون عاملين	4	0	1
مالية	5	0	3
شؤون أعضاء هيئة التدريس	2	0	1
أعضاء هيئة التدريس	3	0	2

Network address: 197.165.1.0

Gateway: 197.165.1.1

Class: C

We made a switch for each office and linked all the switches to a master switch, then found the need for this switch with a server to distribute the IP, then possessed this master switch with the router to buy its popularity with the rest of the attendees, but we made a subnet for the library using a mask 255.255.255.192, the library only had about 64 addresses.



2.2 floor Ground

Room	Computers	Cameras	Printer
السلم اليمين	0	1	0
السلم اليسار	0	1	0
مدرج 1 الى مدرج 5	0	2	0
قاعة برامج خاصة 1	0	1	0
قاعة برامج خاصة 2	0	1	0
مركز استشارات هندسية	3	0	1
غرفة الامن)مدخل الكلية(	1	1	1
وحدة الخدمات الالكترونية	5	0	1
الشؤون الإدارية	1	0	1
الامن	1	0	0
الخزنة	0	1	1
المسرح	0	2	0
شؤون الطلاب	7	0	1
طرقات الكلية	0	6	0

Network address: 197.165.3.0

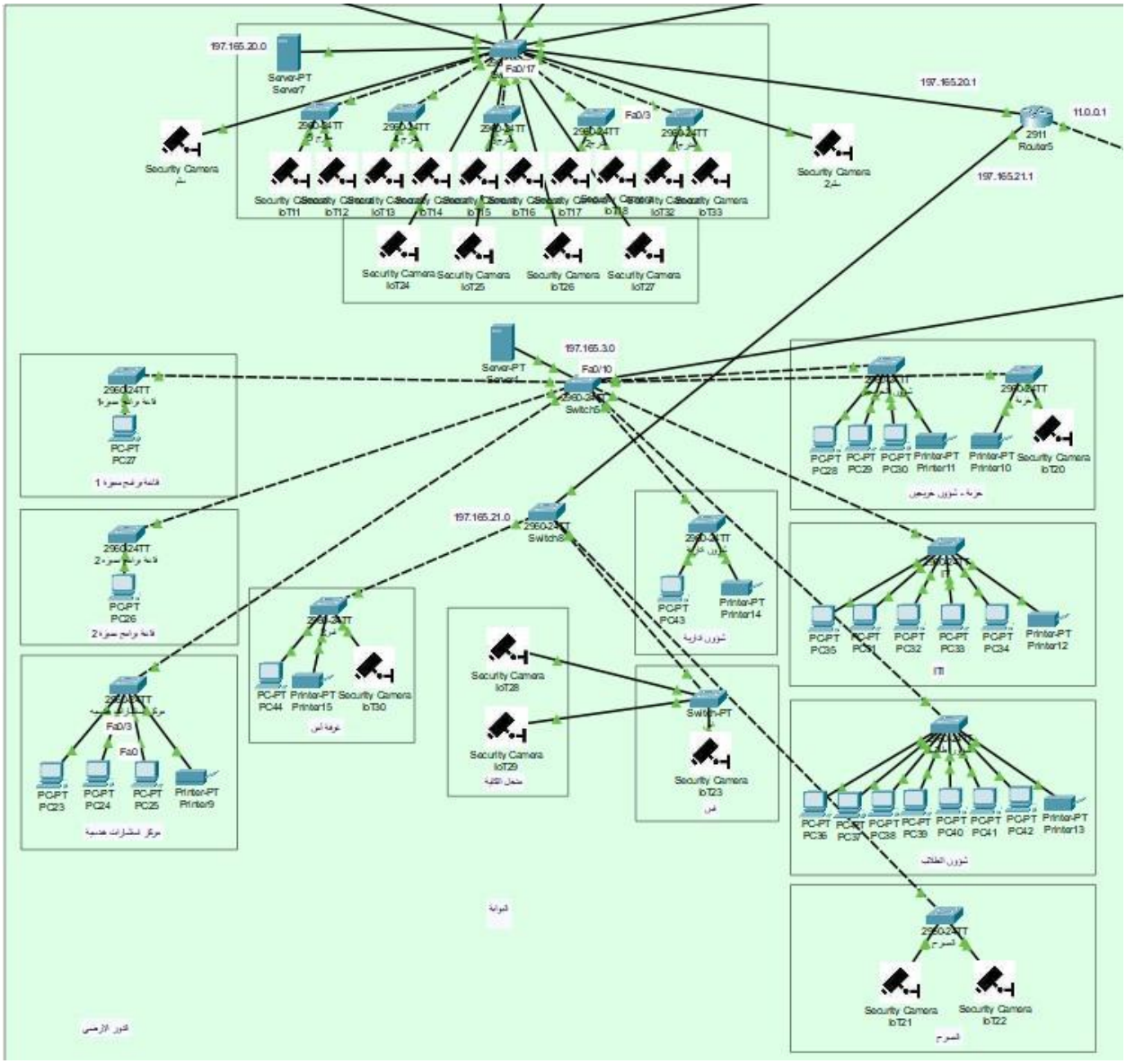
Gateway Server1: 197.165.0.1

Gateway Server2: 197.165.2.1

Class: C

Here also we connected all the devices for each office to a switch, then we connected all these switches to a main switch and connected it to a router so that we could connect it to the rest of the floors.

We connected all security cameras to the security office.


197.165.20.0
Server-PT Server7
Fa0/17
197.165.20.1
11.0.0.1
2911 Router5
Fa0/3
Security Camera
197.165.21.1
IoT11
IoT12
IoT13
IoT14
IoT15
IoT16
IoT17
IoT18
IoT32
IoT33
IoT24
IoT25
IoT26
IoT27
197.165.3.0
Server-PT Server1
Fa0/10
Switch5
PC-PT PC27
PC-PT PC26
197.165.21.0
Switch8
PC-PT PC43
Printer-PT Printer14
PC-PT PC44
Printer-PT Printer15
IoT30
IoT28
IoT29
Switch-PT
IoT23
PC-PT PC23
PC-PT PC24
PC-PT PC25
Printer-PT Printer9
PC-PT PC28
PC-PT PC29
PC-PT PC30
Printer-PT Printer11
Printer-PT Printer10
IoT20
PC-PT PC35
PC-PT PC31
PC-PT PC32
PC-PT PC33
PC-PT PC34
Printer-PT Printer12
PC-PT PC36
PC-PT PC37
PC-PT PC38
PC-PT PC39
PC-PT PC40
PC-PT PC41
PC-PT PC42
Printer-PT Printer13
IoT21
IoT22

2.3 First floor

Room	Computers	Cameras	Printer
السلم اليمين	0	1	0
السلم اليسار	0	1	0
مدرج 6 الى مدرج 10	0	2	0
مدرج اعداد ي	0	2	0
مجلس قسم عمارة	2	0	2
عميد الكلية	1	0	1
سكرتارية عميد الكلية	3	0	2
وكيل الكلية	1	0	1
سكرتارية وكيل الكلية	3	0	2
مجلس الكلية	2	0	1
أعضاء هيئة تدريس 1	1	0	1
أعضاء هيئة تدريس 2	1	0	1
طرقات الكلية	0	4	0

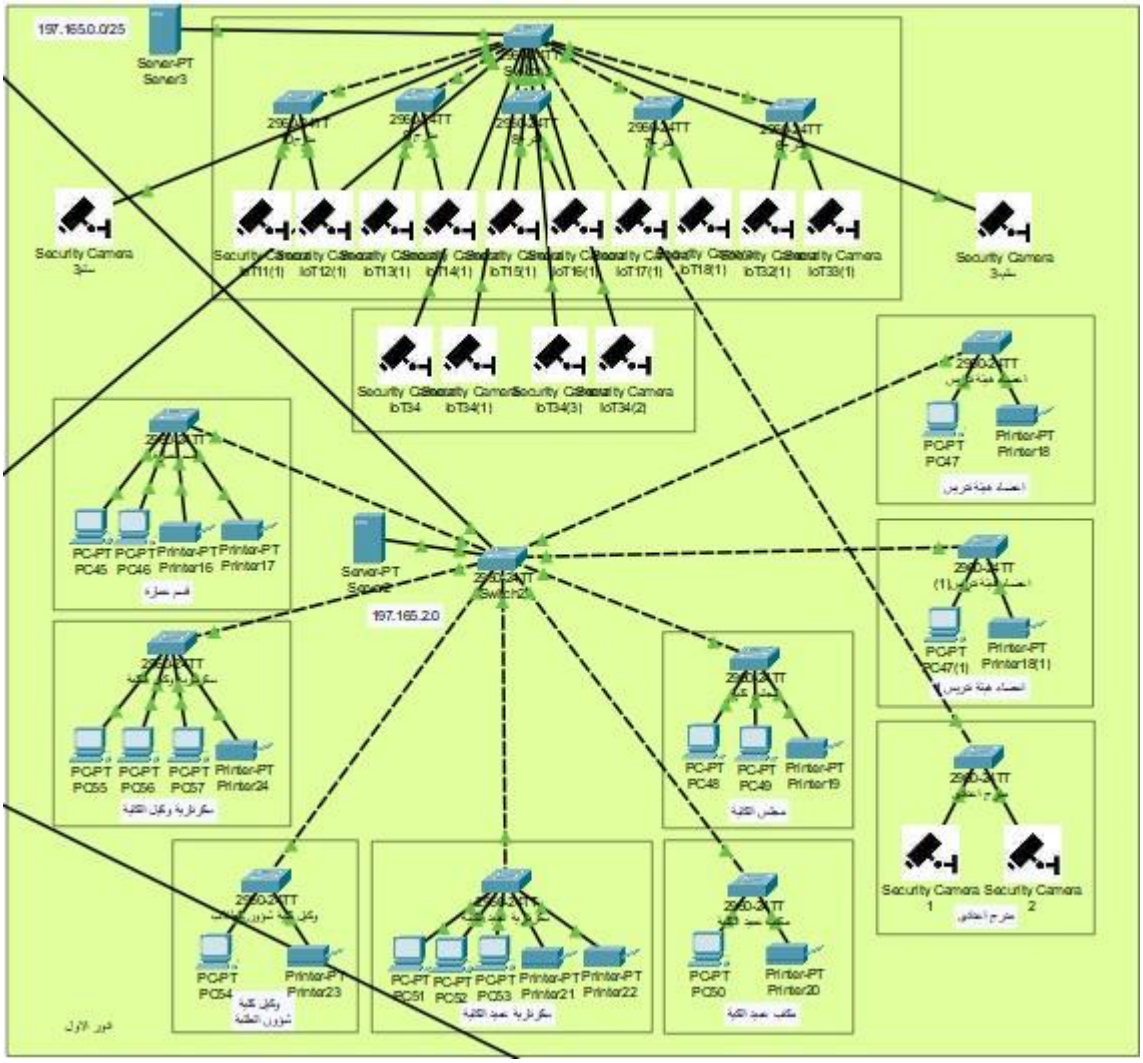
Network address: 197.165.0.2

Gateway Server1: 197.165.20.1

Gateway Server2: 197.165.3.1

Class: C

We did the same thing here, connected all the devices for each office to a switch, then connected all these switches to a main switch and connected it to a router, and the cameras also connected to the security office.


197.165.0.0/25
Server-PT
Server3
Security Camera
Security Camera
Security Camera
Server-PT
Server2
197.165.2.0
PC-PT
PC45
PC-PT
PC46
Printer-PT
Printer16
Printer-PT
Printer17
PC-PT
PC47
Printer-PT
Printer18
PC-PT
PC47(1)
Printer-PT
Printer18(1)
PC-PT
PC48
PC-PT
PC49
Printer-PT
Printer19
PC-PT
PC50
Printer-PT
Printer20
PC-PT
PC51
PC-PT
PC52
PC-PT
PC53
Printer-PT
Printer21
Printer-PT
Printer22
PC-PT
PC54
Printer-PT
Printer23
PC-PT
PC55
PC-PT
PC56
PC-PT
PC57
Printer-PT
Printer24
Security Camera
1
Security Camera
2

2.4 Second floor

Room	Computers	Cameras	Printer
السلم اليمين	0	1	0
السلم اليسار	0	1	0
مدرج 11 الى مدرج 15	0	2	0
اتحاد الطلبة	1	0	1
مجلس قسم كهربا ء	2	0	2
وحده الدعم	1	0	1
مجلس قسم مدني	2	0	2
مجلس قسم ميكانيك ا	2	0	2
مركز ضمان الجودة	2	0	2
معمل أعضاء هيئة تدريس	5	0	2
طرقات الكلية	0	4	0

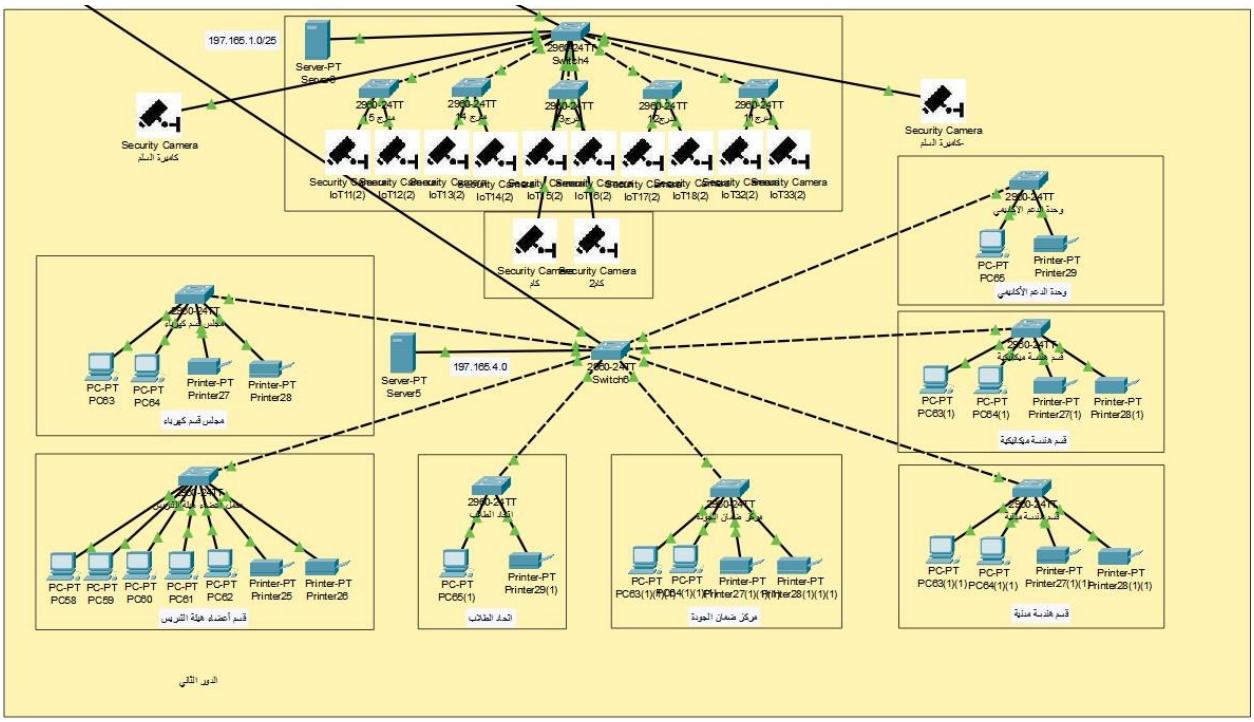
Network address: 197.165.4.0

Gateway Server1: 197.165.1.1

Gateway Server2: 197.165.4.1

Class: C

And the same here, we have many offices do we connected the devices for each office with a switch and connected them to a main switch then connected it to a router.


197.165.1.0/25
Server-PT Server4
2960-24TT Switch4
Security Camera كاميرة السلم
Security Camera كاميرة السلم
Security Camera IoT11(2)
Security Camera IoT12(2)
Security Camera IoT13(2)
Security Camera IoT14(2)
Security Camera IoT15(2)
Security Camera IoT16(2)
Security Camera IoT17(2)
Security Camera IoT18(2)
Security Camera IoT32(2)
Security Camera IoT33(2)
Security Camera كاد
Security Camera كاد
2960-24TT وحدة الدعم الأكاديمي
PC-PT PC65
Printer-PT Printer29
وحدة الدعم الأكاديمي
2960-24TT مجلس قسم كهرباء
PC-PT PC63
PC-PT PC64
Printer-PT Printer27
Printer-PT Printer28
مجلس قسم كهرباء
Server-PT Server5
197.165.4.0
2960-24TT Switch6
2960-24TT قسم هندسة ميكانيكية
PC-PT PC63(1)
PC-PT PC64(1)
Printer-PT Printer27(1)
Printer-PT Printer28(1)
قسم هندسة ميكانيكية
2960-24TT قسم أعضاء هيئة التدريس
PC-PT PC58
PC-PT PC59
PC-PT PC60
PC-PT PC61
PC-PT PC62
Printer-PT Printer25
Printer-PT Printer26
قسم أعضاء هيئة التدريس
2960-24TT الحداد الطلاب
PC-PT PC65(1)
Printer-PT Printer29(1)
الحداد الطلاب
2960-24TT مركز ضمان الجودة
PC-PT PC63(1)(1)
PC-PT PC64(1)(1)
Printer-PT Printer27(1)(1)
Printer-PT Printer28(1)(1)
مركز ضمان الجودة
2960-24TT قسم هندسة مدنية
PC-PT PC63(1)(1)
PC-PT PC64(1)(1)
Printer-PT Printer27(1)(1)
Printer-PT Printer28(1)(1)
قسم هندسة مدنية
الدور الثاني

3. Workshops

Room	Computers	Cameras	Printer
الدور الأو ل	1	3	0
الدور الثاني	2	3	0
الدور الثالث	2	0	0
الدور الرابع)معمل 1 و2)	30	0	0
الدور الرابع) معمل 3 (	22	0	0
الدور الرابع) معمل 4 (	20	0	0
معمل عمار ة	20	0	0

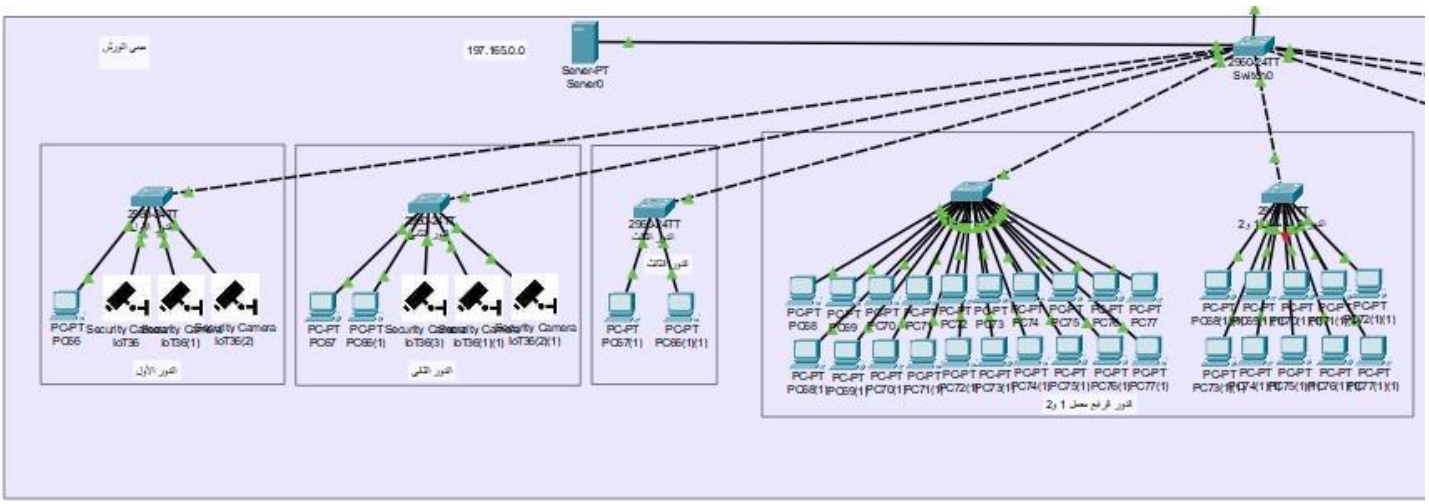
Network address: 197.165.0.0

Gateway: 197.165.0.1

Class: C

No. of addresses: 256

Here, all devices on the same floor are connected to a local switch. These switches are then linked to a main switch, which connects to a server responsible for assigning IP addresses to all devices. Finally, the main switch is connected to a router, enabling connectivity to the Faculty of Engineering's network.


197.165.0.0
Server-PT
Server0
2960-24TT
Switch0
PC-PT
Security Camera
IoT36
IoT36(1)
IoT36(2)
PC67
PC66(1)
IoT36(3)
IoT36(1)(1)
IoT36(2)(1)
PC67(1)
PC66(1)(1)
PC68
PC69
PC70
PC71
PC72
PC73
PC74
PC75
PC76
PC77
PC68(1)
PC69(1)
PC70(1)
PC71(1)
PC72(1)
PC73(1)
PC74(1)
PC75(1)
PC76(1)
PC77(1)