IUS
INSTITUT
UNIVERSITAIRE
DES SCIENCES

Faculté des Sciences et Technologie

(FST)

Niveau : L3-FST

Réseaux 1

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Date : 06 Mars 2025

Réseaux 1

Configuration du Protocole SMTP, IMAP, POP3 , Exploration du Protocole ICMP et Protocole IGMP

TD 6

Objectif :

Ce TD de comprendre et de configurer le protocole SMTP, IMAP, POP3 pour l'envoi d'e-mails dans un environnement réseau simulé.

1. Configurer un serveur de messagerie pour prendre en charge SMTP et IMAP.
2. Configurer des clients pour envoyer des e-mails via SMTP et IMAP.
3. Tester la réception et la gestion des e-mails avec IMAP.
4. Comprendre le fonctionnement et les rôles du protocole ICMP.
5. Observer et analyser les messages ICMP à l'aide d'un outil comme Wireshark.
6. Configurer un réseau multicast sur un routeur et des commutateurs.
7. Observer et analyser les messages IGMP.
8. Tester le transfert de données multicast.

Étapes du TD :

1. Configuration du Protocole SMTP, IMAP :

Topologie du Réseau :

- Appareils :

  Un **serveur** configuré pour IMAP et SMTP.

  Deux **PC clients** connectés via un **switch**.

  Un routeur si les clients et le serveur sont sur différents réseaux.

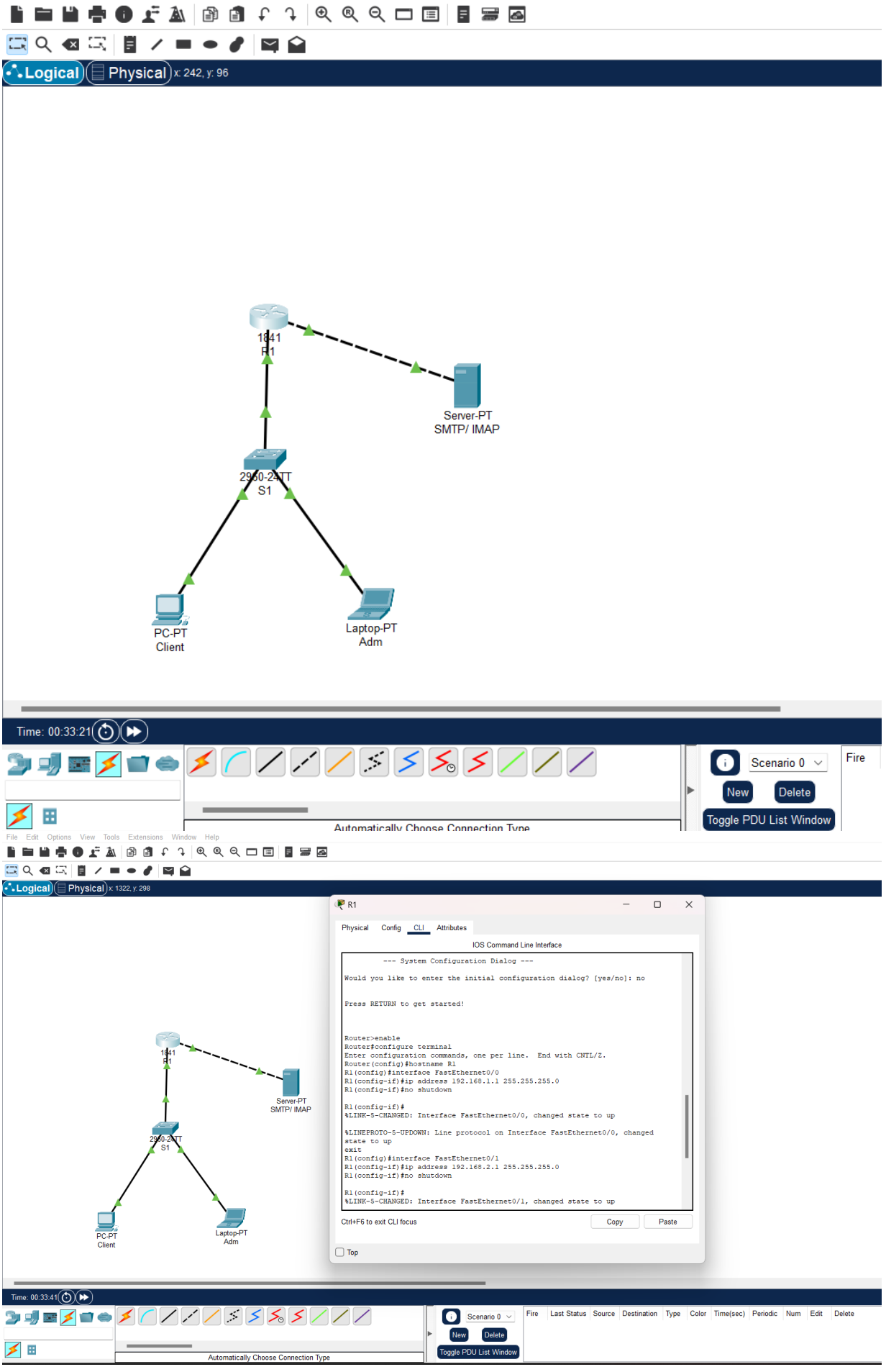
Contenu du rapport

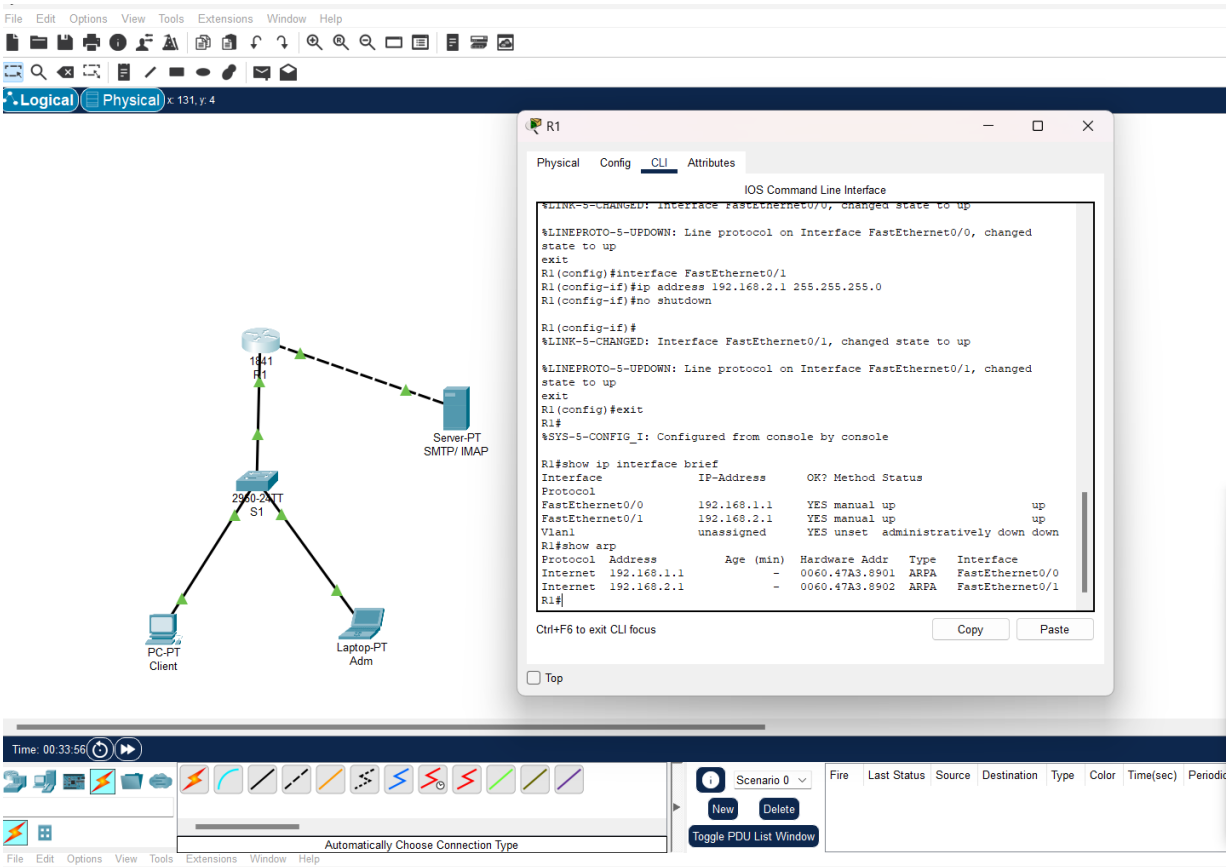
Le rapport doit inclure :

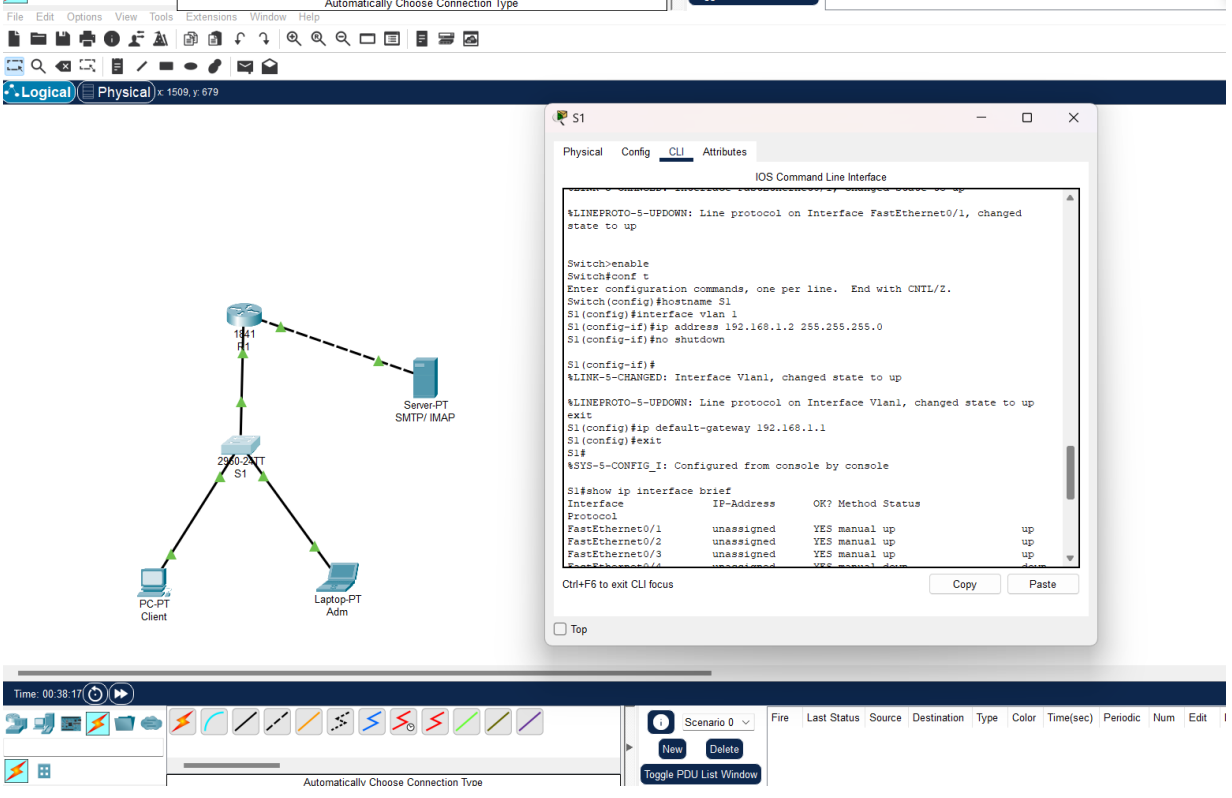
1. Une page de couverture.
2. Une description des résultats de la tâche.
3. Les résultats de l'exécution des commandes (captures d'écran).
4. Les conclusions sur la tâche accomplie.
5. Hébergez le rapport de travail au format Word et PDF,le fichier pkt, ainsi que les images sur GitHub.

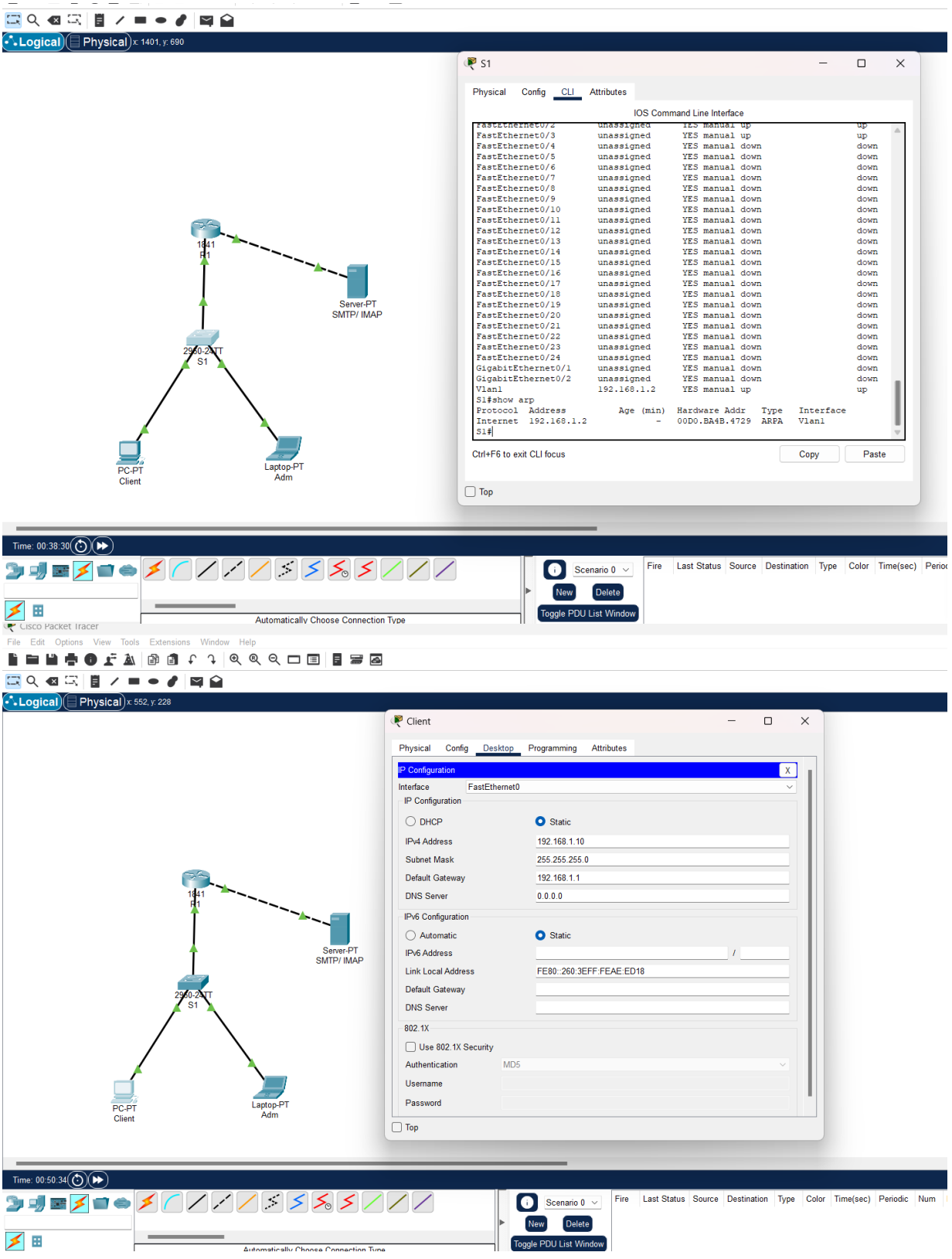
Travaux Dirigés :

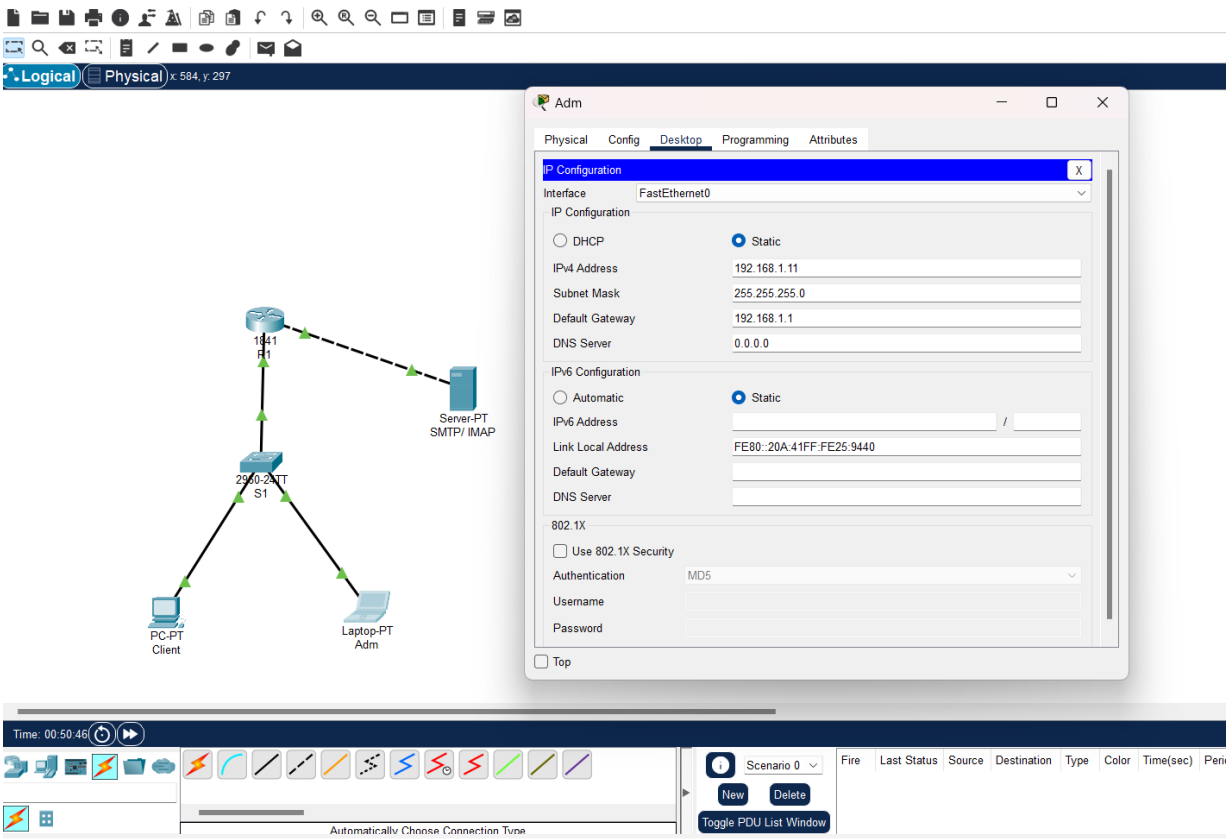
1. Configurer les protocoles SMTP, IMAP et POP3 afin d'assurer l'envoi, la réception et la gestion efficace des courriels.

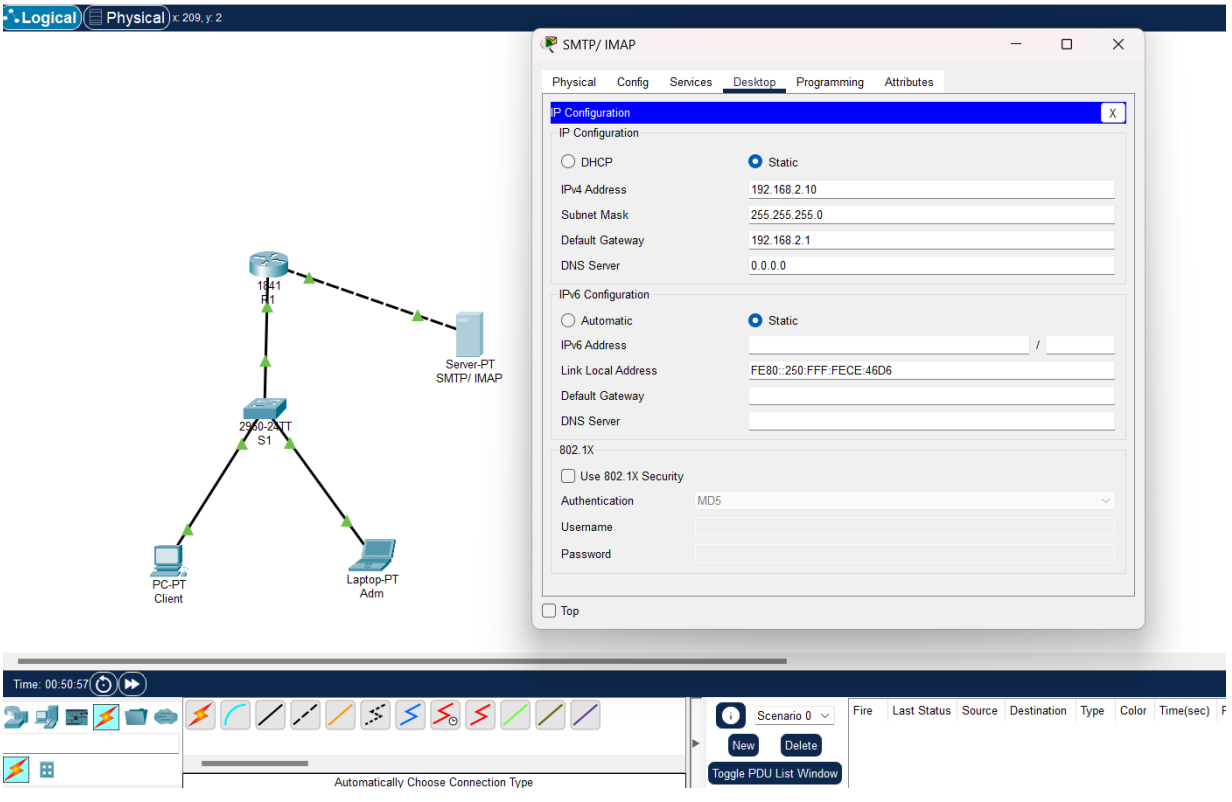


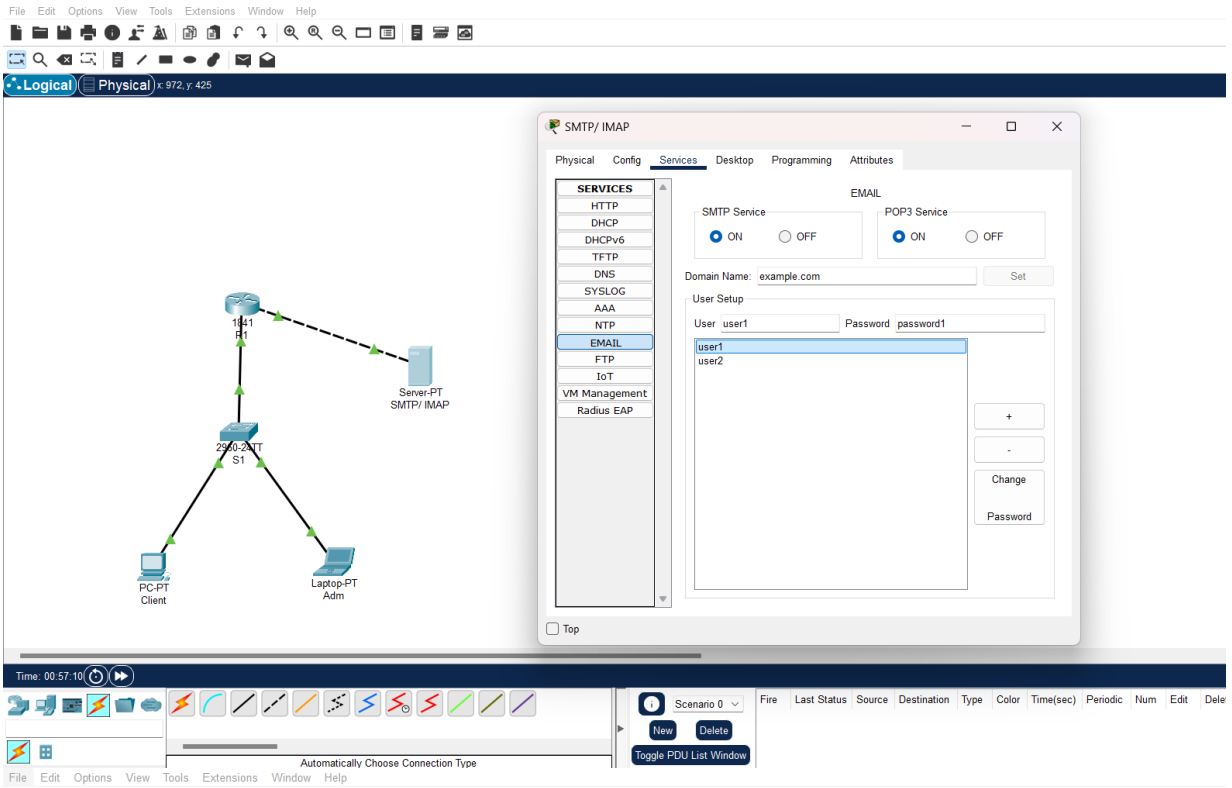

File Edit Options View Tools Extensions Window Help
Logical Physical x: 131, y: 4
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
R1
Physical Config CLI Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
R1(config)#interface FastEthernet0/1
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.1.1 YES manual up up
FastEthernet0/1 192.168.2.1 YES manual up up
Vlan1 unassigned YES unset administratively down down
R1#show arp
Protocol Address Age (min) Hardware Addr Type Interface
Internet 192.168.1.1 - 0060.47A3.8901 ARPA FastEthernet0/0
Internet 192.168.2.1 - 0060.47A3.8902 ARPA FastEthernet0/1
R1#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Time: 00:33:56
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic

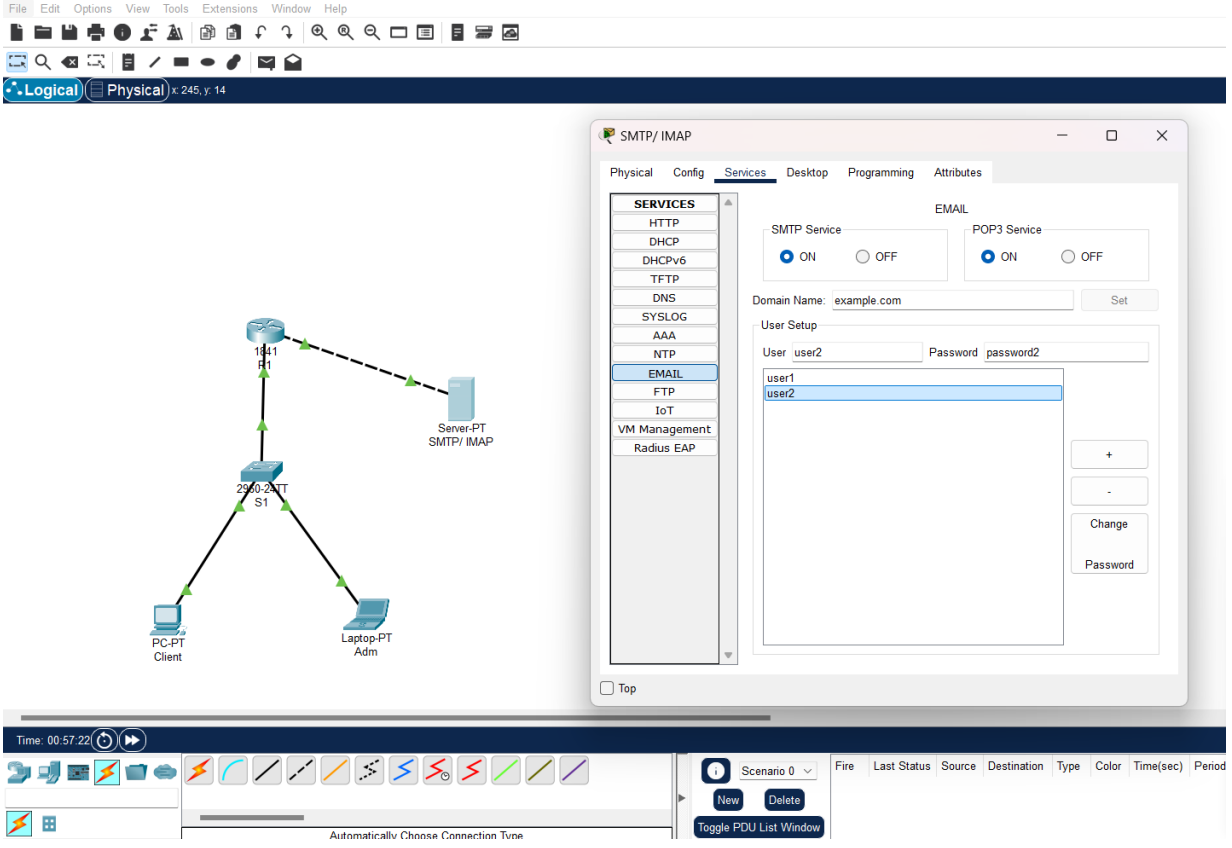

File Edit Options View Tools Extensions Window Help
Logical Physical x: 1509, y: 679
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
S1
Physical Config CLI Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#interface vlan 1
S1(config-if)#ip address 192.168.1.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
S1(config)#ip default-gateway 192.168.1.1
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
S1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/1 unassigned YES manual up up
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Time: 00:38:17
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit

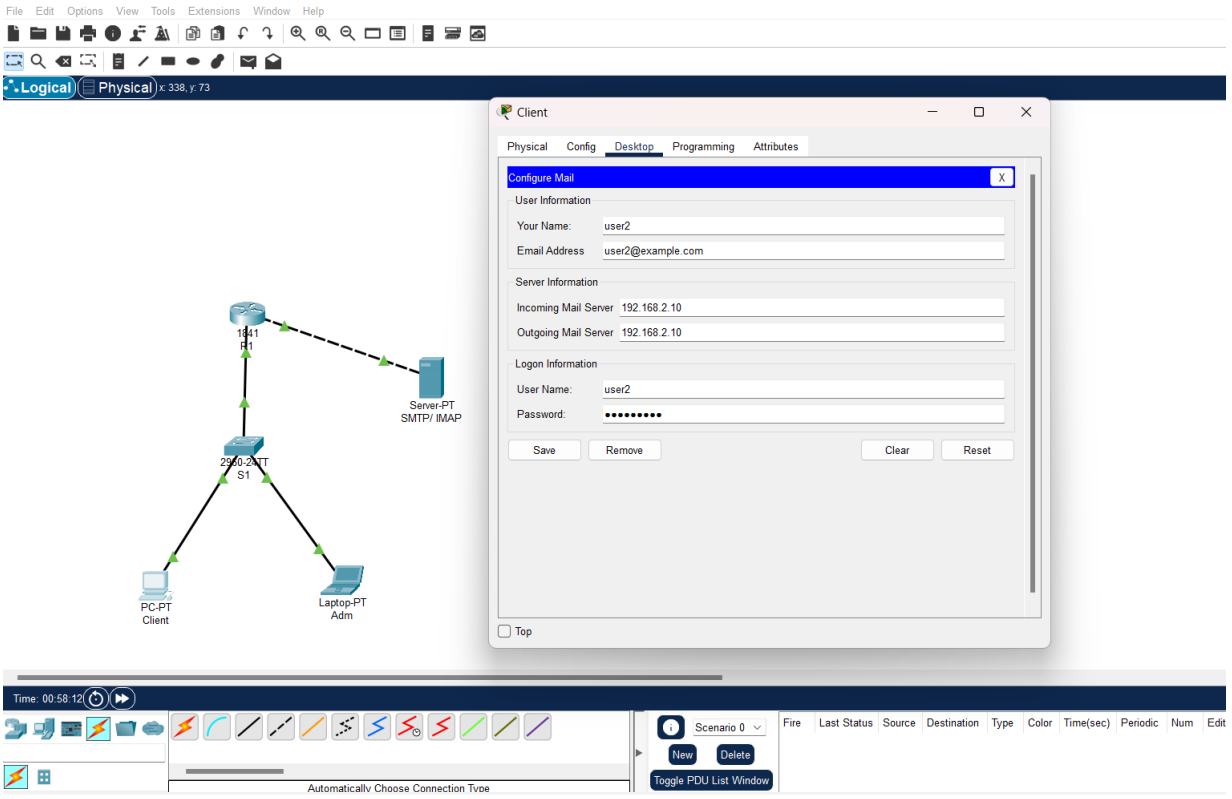

Logical
Physical
x: 1401, y: 690
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
S1
Physical
Config
CLI
Attributes
IOS Command Line Interface
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual down down
FastEthernet0/5 unassigned YES manual down down
FastEthernet0/6 unassigned YES manual down down
FastEthernet0/7 unassigned YES manual down down
FastEthernet0/8 unassigned YES manual down down
FastEthernet0/9 unassigned YES manual down down
FastEthernet0/10 unassigned YES manual down down
FastEthernet0/11 unassigned YES manual down down
FastEthernet0/12 unassigned YES manual down down
FastEthernet0/13 unassigned YES manual down down
FastEthernet0/14 unassigned YES manual down down
FastEthernet0/15 unassigned YES manual down down
FastEthernet0/16 unassigned YES manual down down
FastEthernet0/17 unassigned YES manual down down
FastEthernet0/18 unassigned YES manual down down
FastEthernet0/19 unassigned YES manual down down
FastEthernet0/20 unassigned YES manual down down
FastEthernet0/21 unassigned YES manual down down
FastEthernet0/22 unassigned YES manual down down
FastEthernet0/23 unassigned YES manual down down
FastEthernet0/24 unassigned YES manual down down
GigabitEthernet0/1 unassigned YES manual down down
GigabitEthernet0/2 unassigned YES manual down down
Vlan1 192.168.1.2 YES manual up up
S1#show arp
Protocol Address Age (min) Hardware Addr Type Interface
Internet 192.168.1.2 - 00D0.BA4B.4729 ARPA Vlan1
S1#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Time: 00:38:30
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Cisco Packet Tracer
File
Edit
Options
View
Tools
Extensions
Window
Help
Logical
Physical
x: 552, y: 228
Client
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.10
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::260:3EFF:FEAE:ED18
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Time: 00:50:34
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num


Logical
Physical
x: 584, y: 297
Adm
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.11
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20A:41FF:FE25:9440
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Time: 00:50:46
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Automatically Choose Connection Type

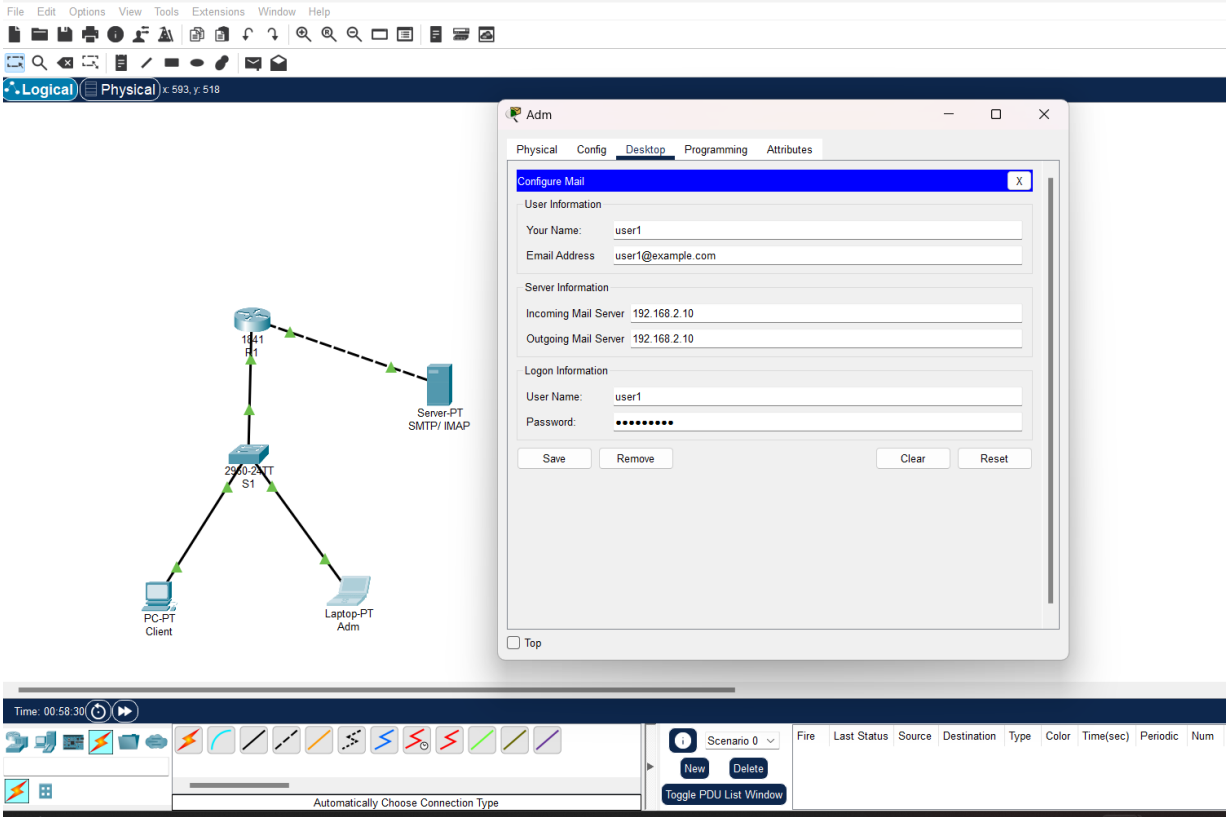

File
Edit
Options
View
Tools
Extensions
Window
Help
Logical
Physical
x: 209, y: 2
SMTP/ IMAP
Physical
Config
Services
Desktop
Programming
Attributes
IP Configuration
IP Configuration
DHCP
Static
IPv4 Address
192.168.2.10
Subnet Mask
255.255.255.0
Default Gateway
192.168.2.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::250:FFF:FECE:46D6
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Time: 00:50:57
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Automatically Choose Connection Type


File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 972, y: 425
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
SMTP/ IMAP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
EMAIL
SMTP Service
ON
OFF
POP3 Service
ON
OFF
Domain Name:
example.com
Set
User Setup
User
user1
Password
password1
user1
user2
+
-
Change
Password
Top
Time: 00:57:10
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Dele

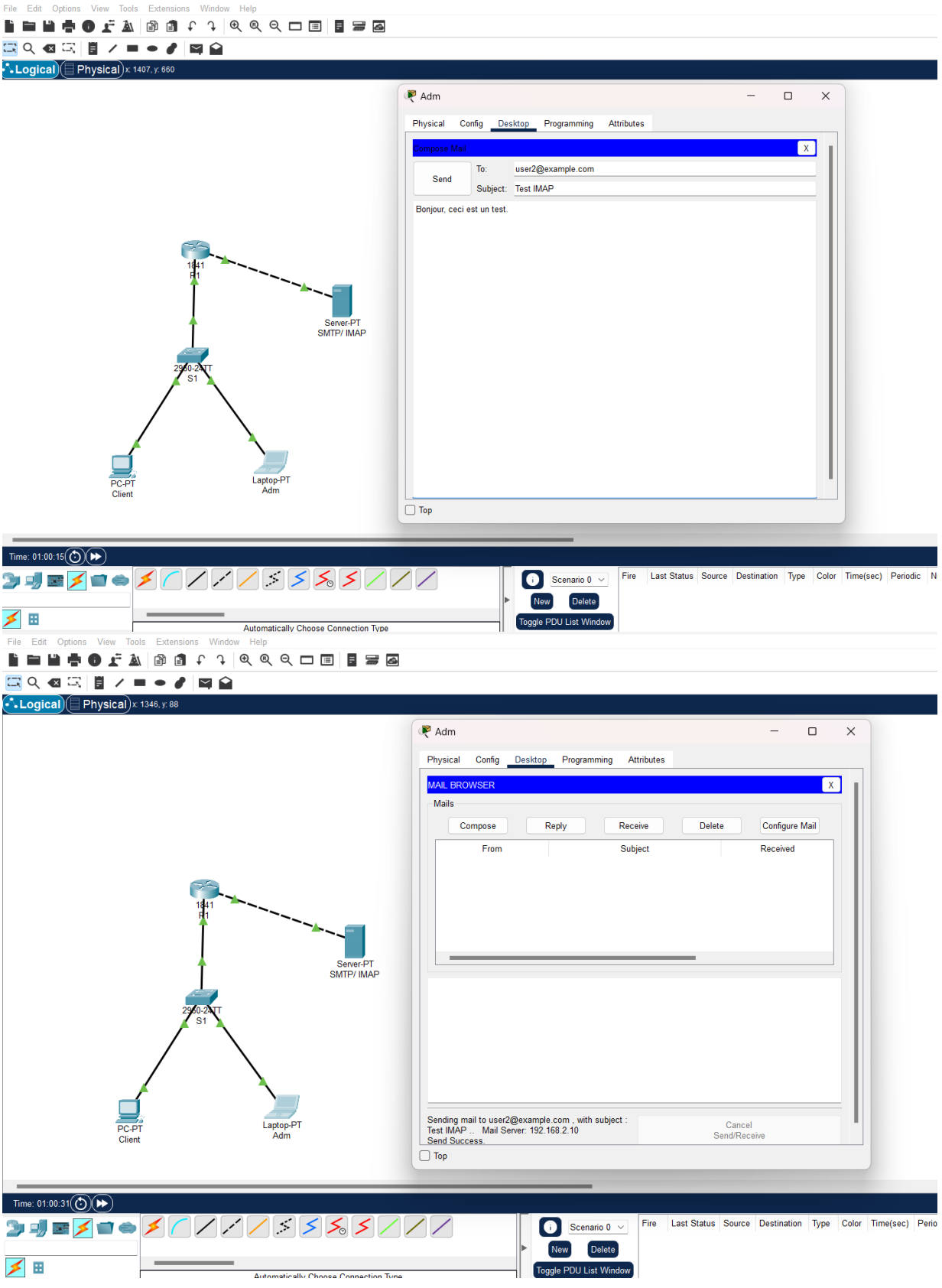

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 245, y: 14
1841
R1
Server-PT
SMTP/ IMAP
2960-24TT
S1
PC-PT
Client
Laptop-PT
Adm
SMTP/ IMAP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
EMAIL
SMTP Service
ON
OFF
POP3 Service
ON
OFF
Domain Name:
example.com
Set
User Setup
User
user2
Password
password2
user1
user2
+
-
Change
Password
Top
Time: 00:57:22
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Period

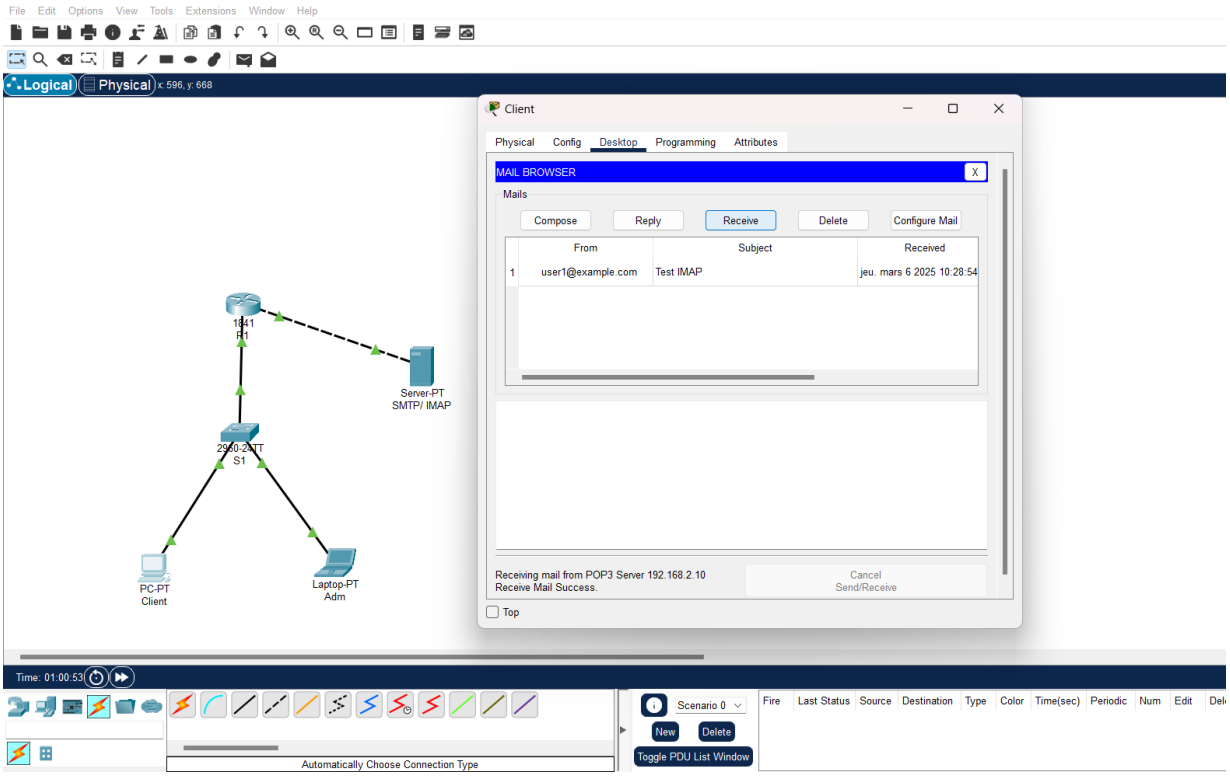

File Edit Options View Tools Extensions Window Help
Logical Physical x: 338, y: 73
1841
R1
Server-PT
SMTP/ IMAP
2950-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Client
Physical Config Desktop Programming Attributes
Configure Mail
X
User Information
Your Name: user2
Email Address user2@example.com
Server Information
Incoming Mail Server 192.168.2.10
Outgoing Mail Server 192.168.2.10
Logon Information
User Name: user2
Password: ••••••••••
Save Remove Clear Reset
Top

Time: 00:58:12
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit


File Edit Options View Tools Extensions Window Help
Logical Physical x: 593, y: 518
1841
R1
Server-PT
SMTP/ IMAP
2950-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Adm
Physical Config Desktop Programming Attributes
Configure Mail
X
User Information
Your Name: user1
Email Address user1@example.com
Server Information
Incoming Mail Server 192.168.2.10
Outgoing Mail Server 192.168.2.10
Logon Information
User Name: user1
Password: ••••••••••
Save Remove Clear Reset
Top

Time: 00:58:30
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num

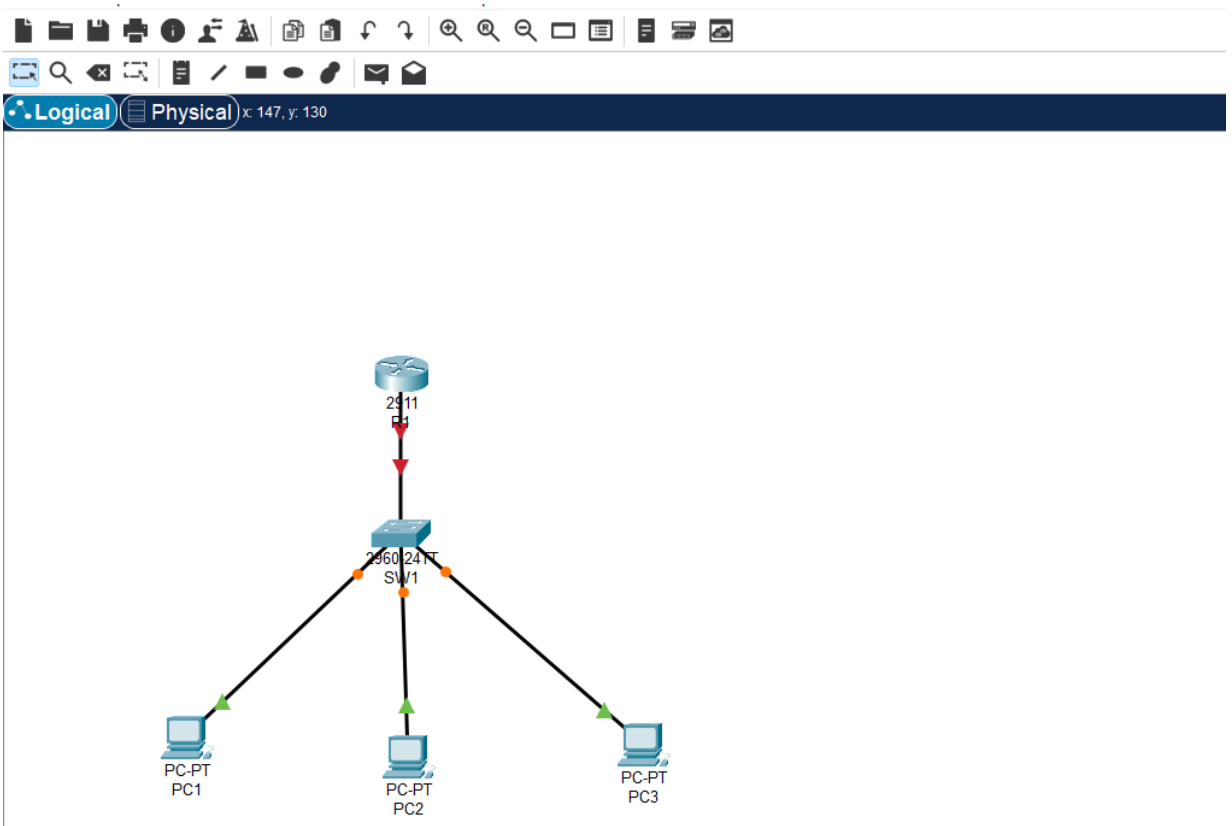

File Edit Options View Tools Extensions Window Help
Logical Physical x: 1407, y: 660
Adm
Physical Config Desktop Programming Attributes
Compose Mail
Send
To: user2@example.com
Subject: Test IMAP
Bonjour, ceci est un test.
Top
1841
R1
Server-PT
SMTP/ IMAP
2950-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Time: 01:00:15
Automatically Choose Connection Type
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1346, y: 88
Adm
Physical Config Desktop Programming Attributes
MAIL BROWSER
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
Sending mail to user2@example.com , with subject :
Test IMAP .. Mail Server: 192.168.2.10
Send Success.
Cancel
Send/Receive
Top
1841
R1
Server-PT
SMTP/ IMAP
2950-24TT
S1
PC-PT
Client
Laptop-PT
Adm
Time: 01:00:31
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Perio

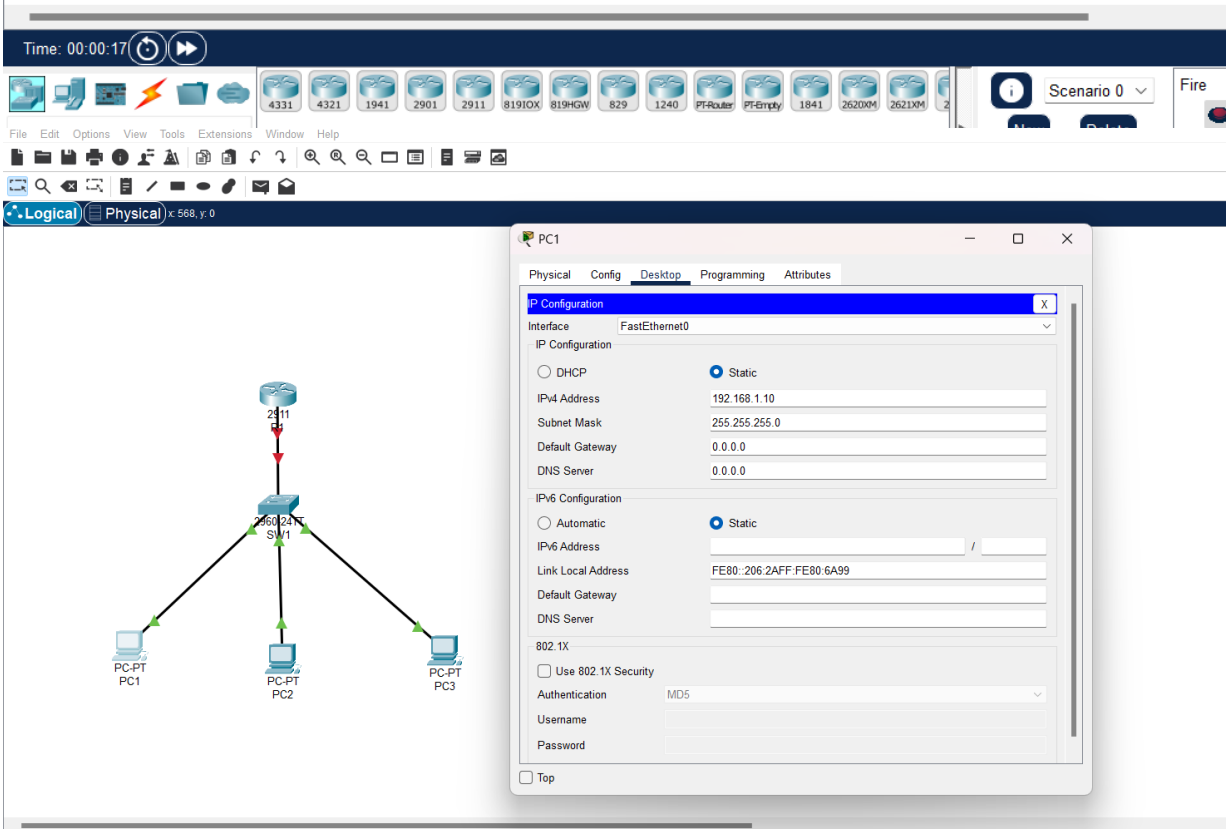


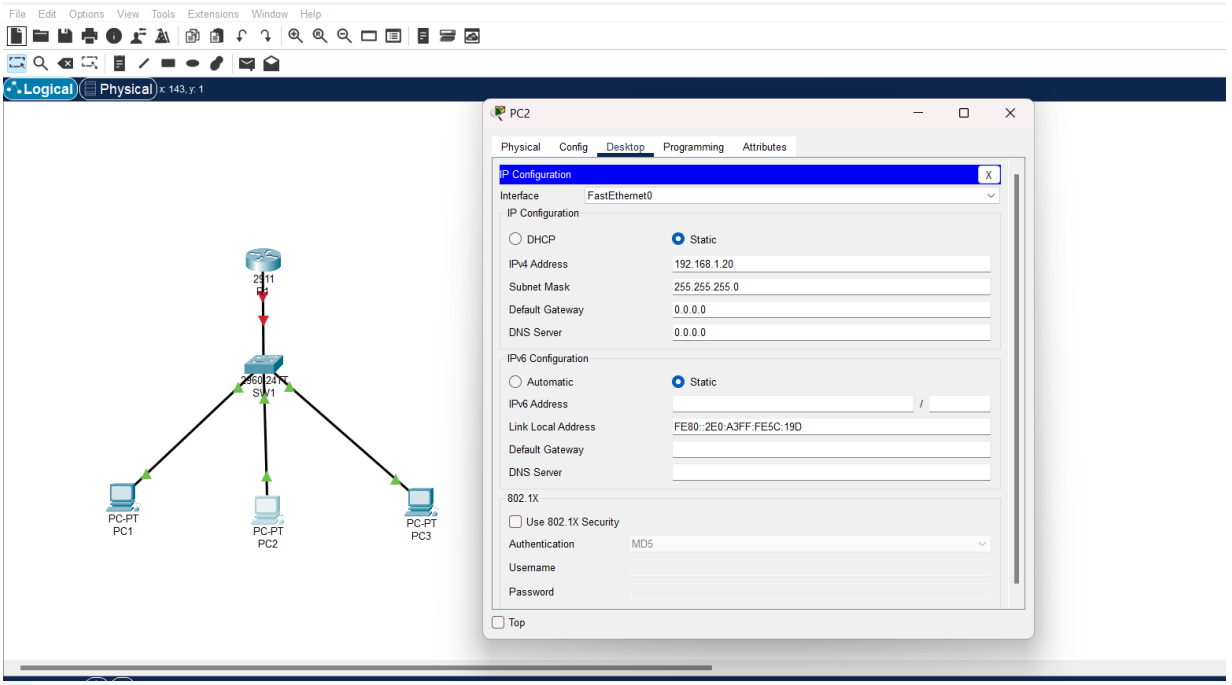
CONCLUSION

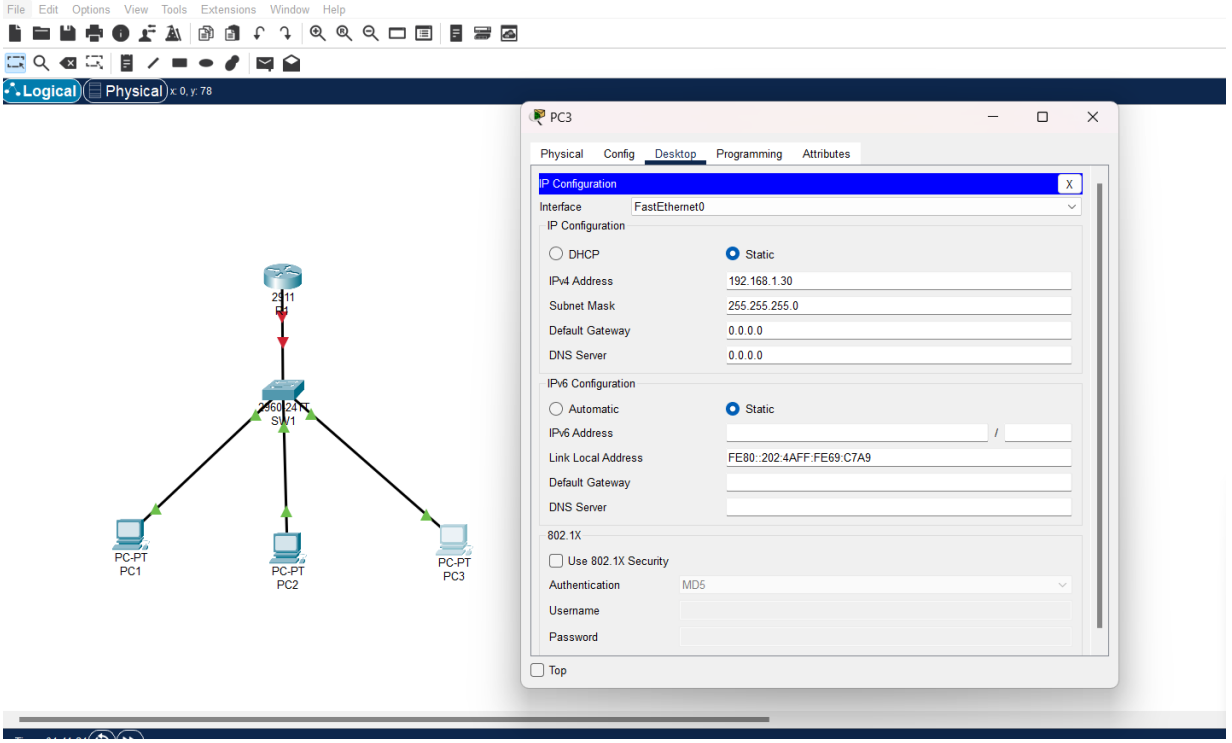
L’exercice a consisté à configurer un serveur de messagerie prenant en charge SMTP (pour l’envoi) et IMAP (pour la gestion des courriels), ainsi que des clients pour tester l’envoi et la réception. Les résultats ont confirmé le bon fonctionnement des protocoles, avec des captures d’écran illustrant la communication réussie entre clients et serveur. Les tests IMAP ont validé la gestion efficace des boîtes de réception, démontrant l’importance de ces protocoles dans les systèmes de messagerie modernes.

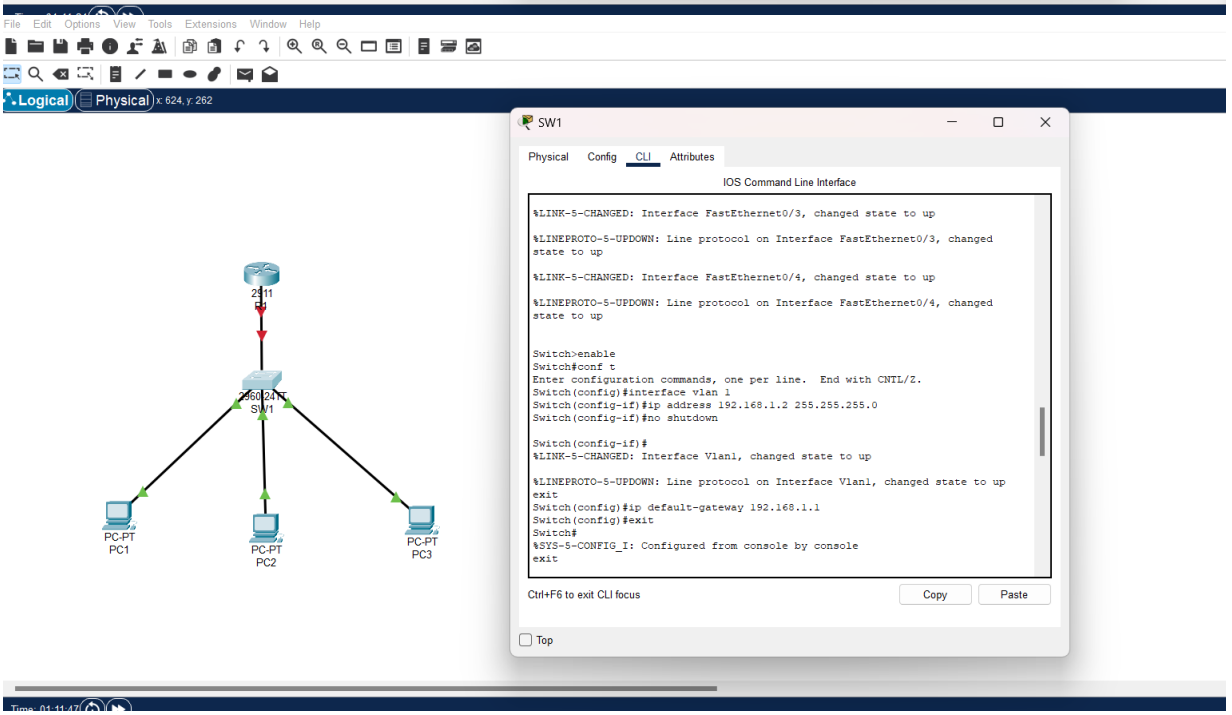
2. **Configurer les protocoles ICMP et IGMP sur les équipements réseau afin d'assurer le diagnostic, le contrôle des communications et la gestion efficace des flux multicast.**

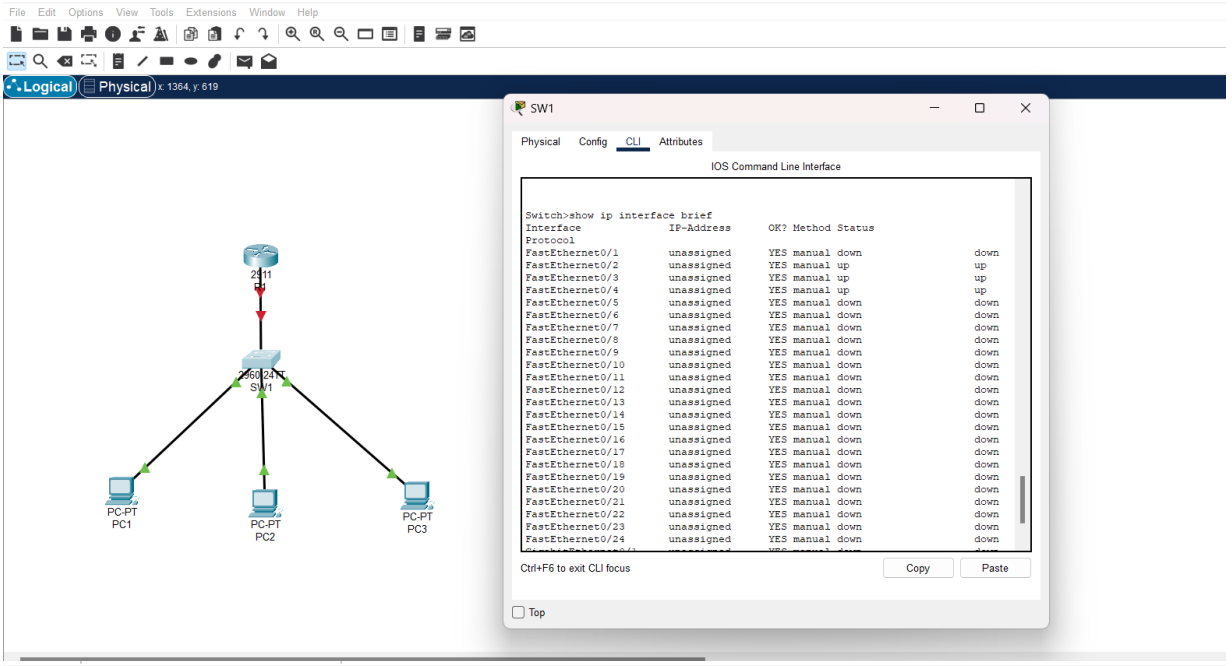


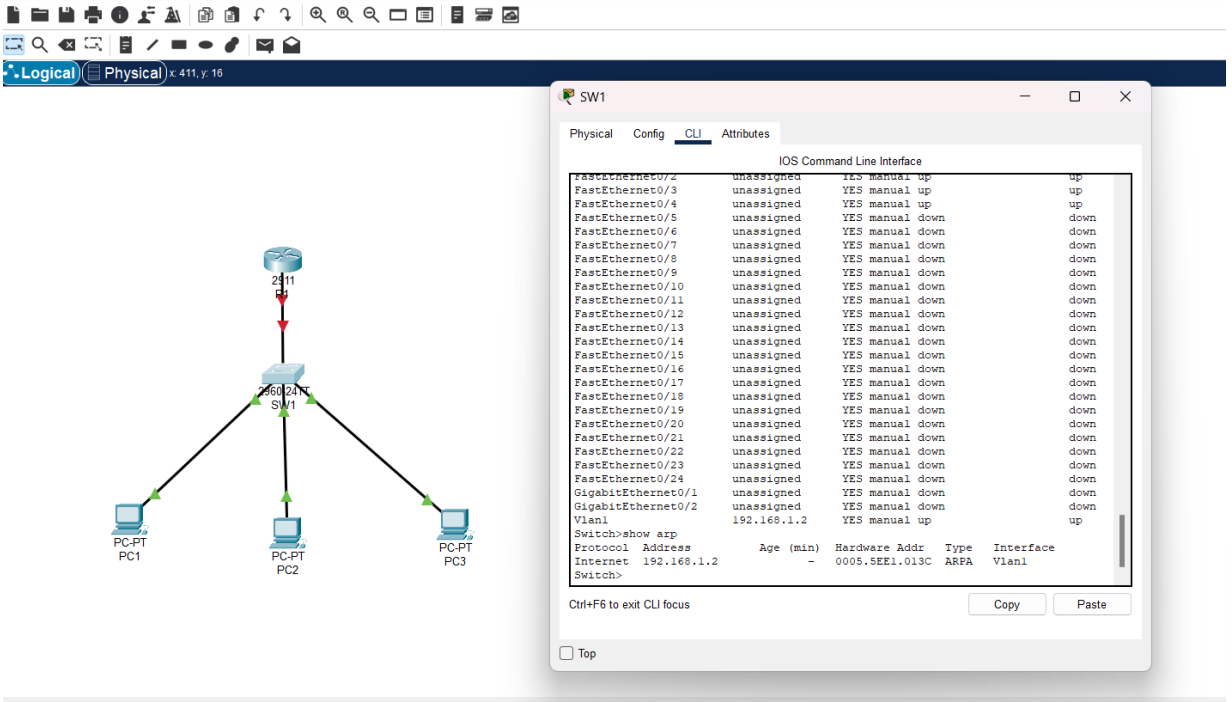


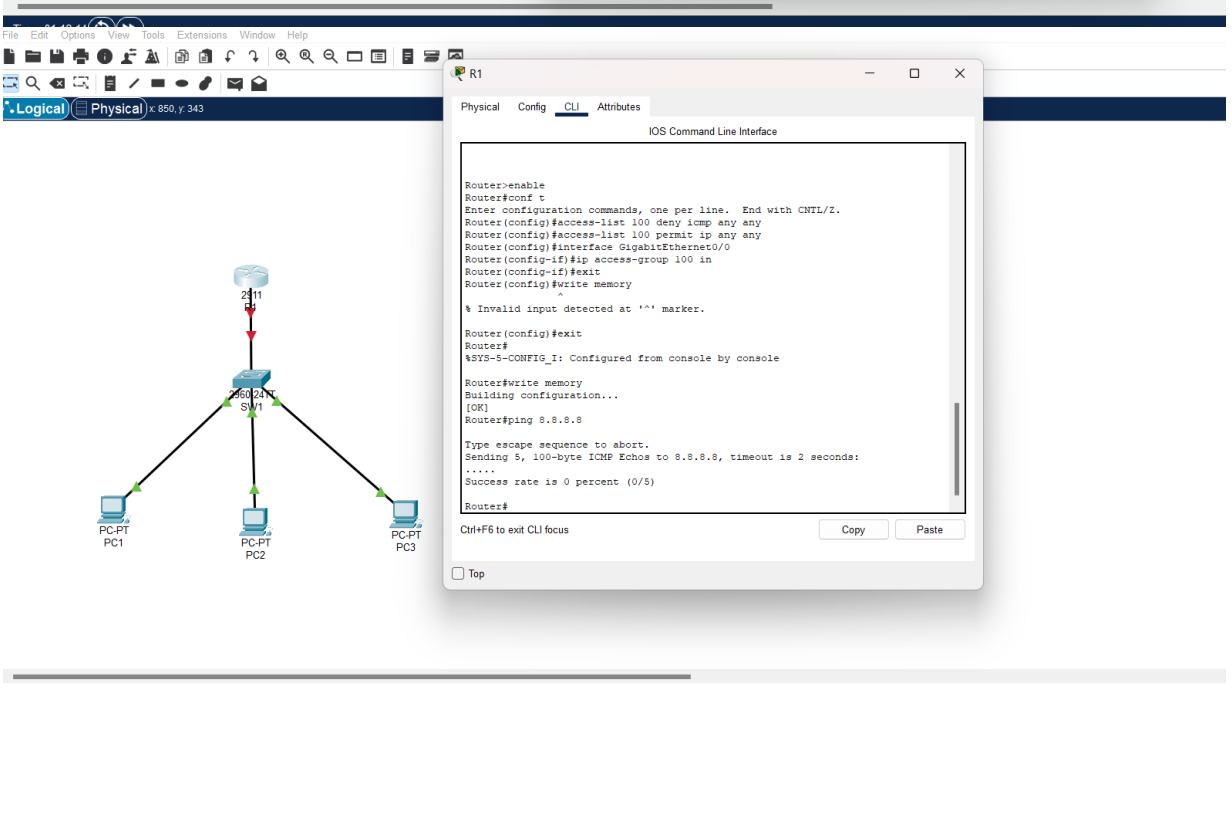

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 143, y: 1
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.20
Subnet Mask
255.255.255.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:A3FF:FE5C:19D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

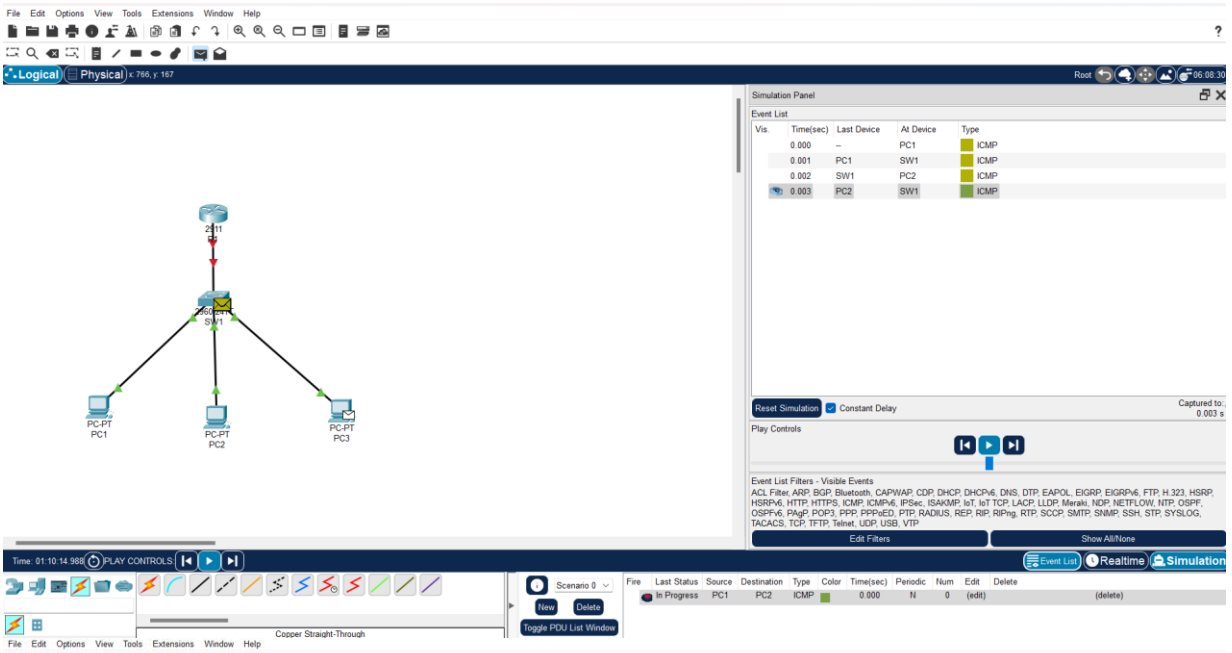

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 0, y: 78
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
PC3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.30
Subnet Mask
255.255.255.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::202:4AFF:FE69:C7A9
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

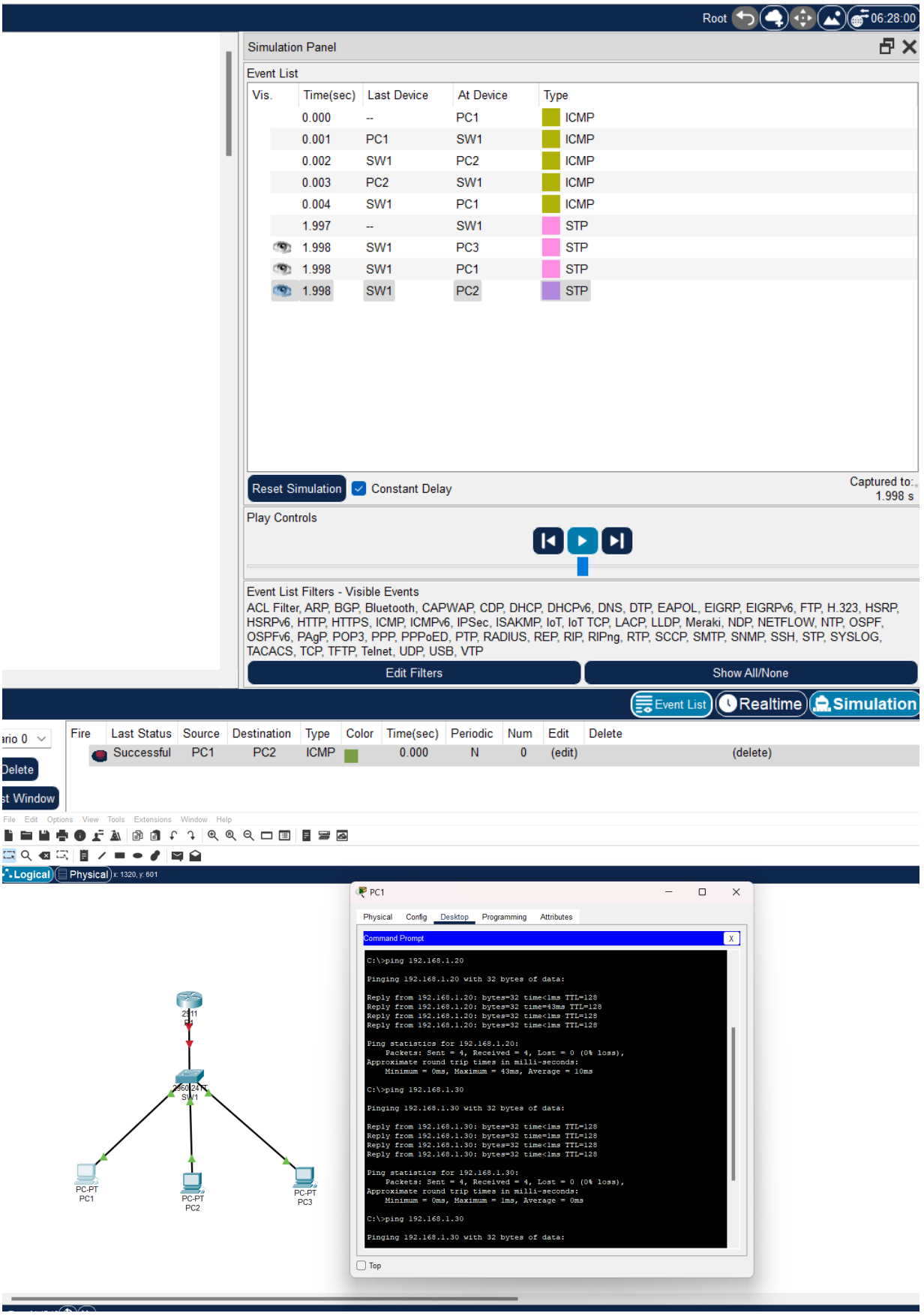

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 624, y: 262
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
SW1
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.168.1.2 255.255.255.0
Switch(config-if)#no shutdown
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
Switch(config)#ip default-gateway 192.168.1.1
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
exit
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

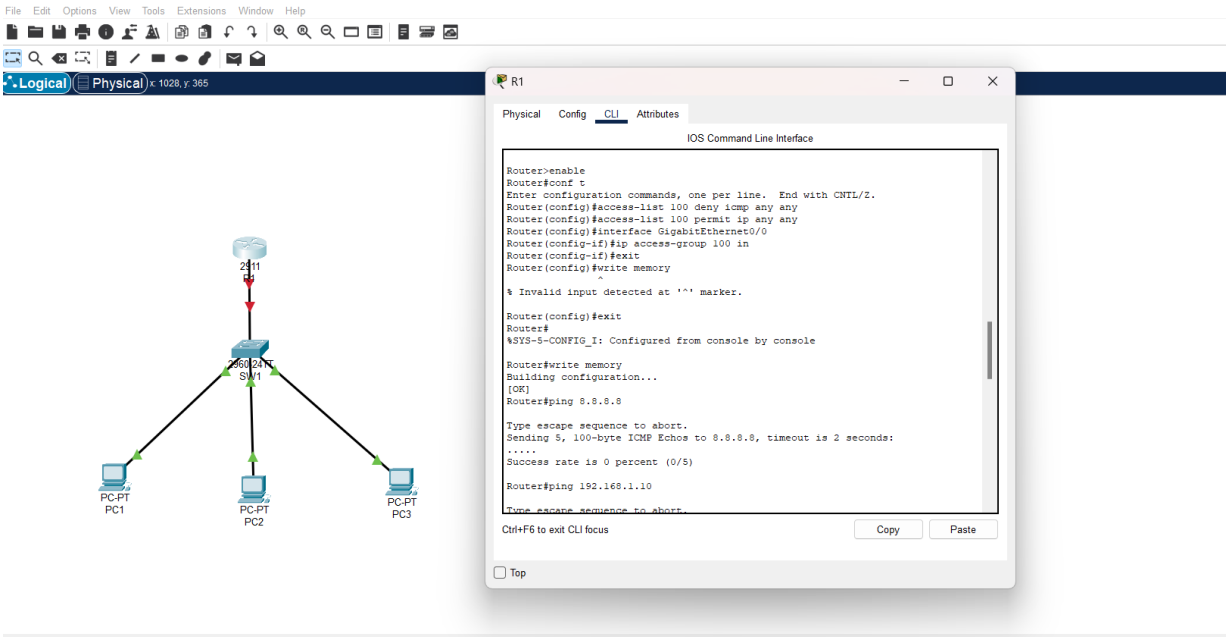

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1364, y: 619
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
SW1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Switch>show ip interface brief
Interface IP-Address OK? Method Status
Protocol
FastEthernet0/1 unassigned YES manual down down
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual up up
FastEthernet0/5 unassigned YES manual down down
FastEthernet0/6 unassigned YES manual down down
FastEthernet0/7 unassigned YES manual down down
FastEthernet0/8 unassigned YES manual down down
FastEthernet0/9 unassigned YES manual down down
FastEthernet0/10 unassigned YES manual down down
FastEthernet0/11 unassigned YES manual down down
FastEthernet0/12 unassigned YES manual down down
FastEthernet0/13 unassigned YES manual down down
FastEthernet0/14 unassigned YES manual down down
FastEthernet0/15 unassigned YES manual down down
FastEthernet0/16 unassigned YES manual down down
FastEthernet0/17 unassigned YES manual down down
FastEthernet0/18 unassigned YES manual down down
FastEthernet0/19 unassigned YES manual down down
FastEthernet0/20 unassigned YES manual down down
FastEthernet0/21 unassigned YES manual down down
FastEthernet0/22 unassigned YES manual down down
FastEthernet0/23 unassigned YES manual down down
FastEthernet0/24 unassigned YES manual down down
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

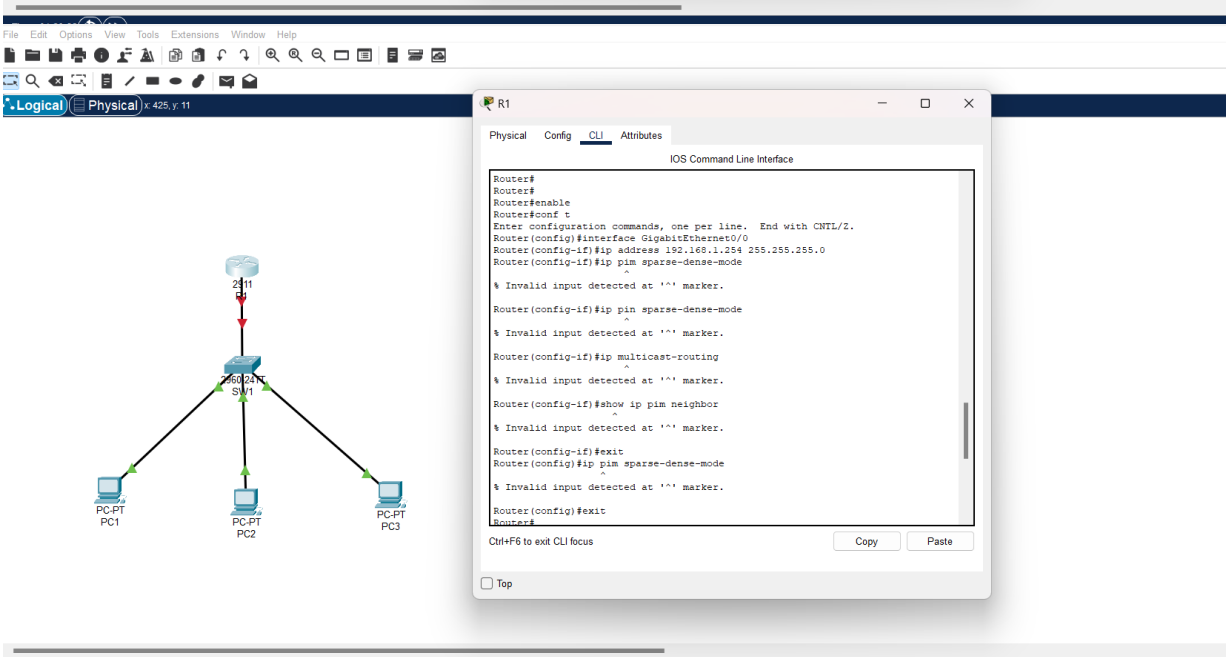

Logical
Physical
x: 411, y: 16
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
SW1
Physical
Config
CLI
Attributes
IOS Command Line Interface
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual up up
FastEthernet0/4 unassigned YES manual up up
FastEthernet0/5 unassigned YES manual down down
FastEthernet0/6 unassigned YES manual down down
FastEthernet0/7 unassigned YES manual down down
FastEthernet0/8 unassigned YES manual down down
FastEthernet0/9 unassigned YES manual down down
FastEthernet0/10 unassigned YES manual down down
FastEthernet0/11 unassigned YES manual down down
FastEthernet0/12 unassigned YES manual down down
FastEthernet0/13 unassigned YES manual down down
FastEthernet0/14 unassigned YES manual down down
FastEthernet0/15 unassigned YES manual down down
FastEthernet0/16 unassigned YES manual down down
FastEthernet0/17 unassigned YES manual down down
FastEthernet0/18 unassigned YES manual down down
FastEthernet0/19 unassigned YES manual down down
FastEthernet0/20 unassigned YES manual down down
FastEthernet0/21 unassigned YES manual down down
FastEthernet0/22 unassigned YES manual down down
FastEthernet0/23 unassigned YES manual down down
FastEthernet0/24 unassigned YES manual down down
GigabitEthernet0/1 unassigned YES manual down down
GigabitEthernet0/2 unassigned YES manual down down
Vlan1 192.168.1.2 YES manual up up
Switch>show arp
Protocol Address Age (min) Hardware Addr Type Interface
Internet 192.168.1.2 - 0005.5EE1.013C ARPA Vlan1
Switch>
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

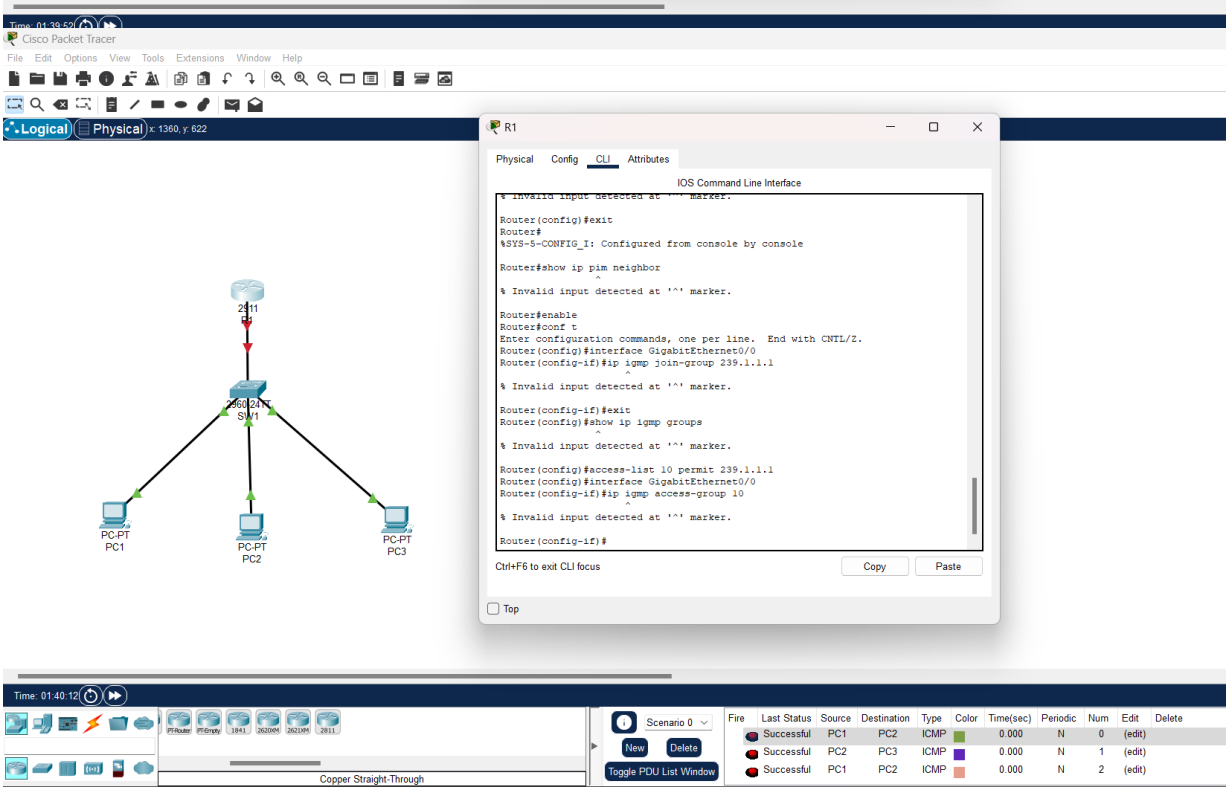

File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 850, y: 343
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#access-list 100 deny icmp any any
Router(config)#access-list 100 permit ip any any
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip access-group 100 in
Router(config-if)#exit
Router(config)#write memory
^
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#write memory
Building configuration...
[OK]
Router#ping 8.8.8.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
Router#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


File Edit Options View Tools Extensions Window Help
Logical Physical x: 766, y: 167
Root 06:08:30
2811
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 -- PC1 ICMP
0.001 PC1 SW1 ICMP
0.002 SW1 PC2 ICMP
0.003 PC2 SW1 ICMP
Reset Simulation
Constant Delay
Captured to: 0.003 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 01:10:14.988 PLAY CONTROLS
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
In Progress PC1 PC2 ICMP 0.000 N 0 (edit) (delete)
Copper Straight-Through
File Edit Options View Tools Extensions Window Help
Logical Physical x: 584, y: 169
Root 06:17:30
2811
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 -- PC1 ICMP
0.001 PC1 SW1 ICMP
0.002 SW1 PC2 ICMP
0.003 PC2 SW1 ICMP
0.004 SW1 PC1 ICMP
1.997 -- SW1 STP
1.998 SW1 PC3 STP
1.998 SW1 PC1 STP
1.998 SW1 PC2 STP
Reset Simulation
Constant Delay
Captured to: 1.998 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 01:10:16.983 PLAY CONTROLS
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC1 PC2 ICMP 0.000 N 0 (edit) (delete)
Copper Straight-Through

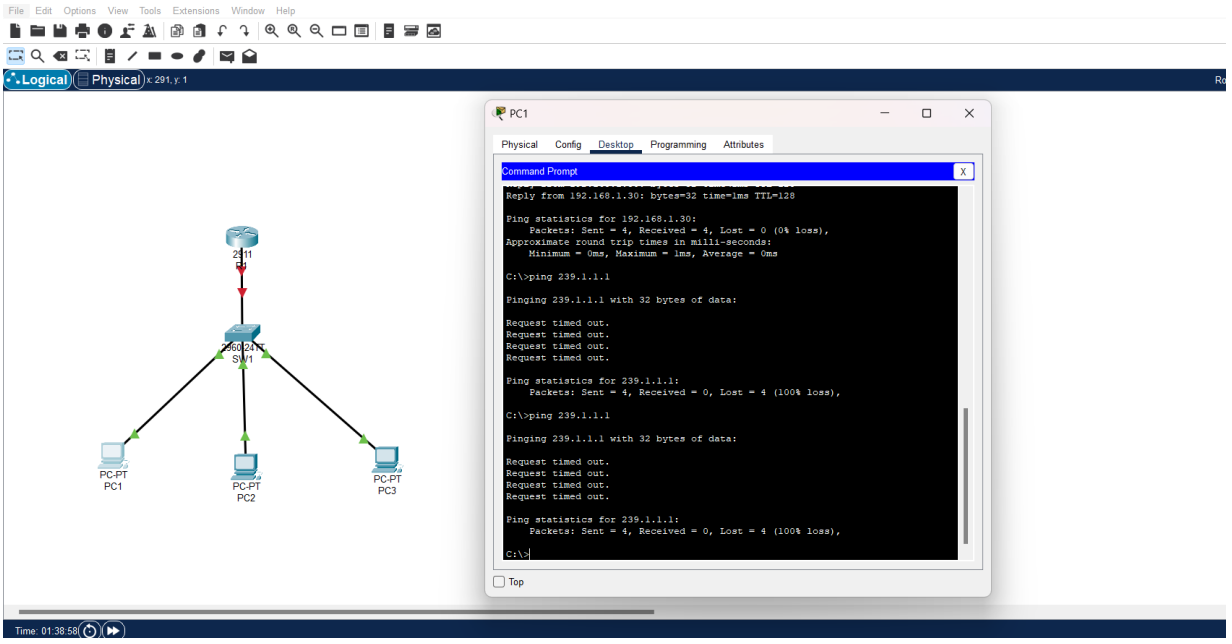

Root
06:28:00
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 -- PC1 ICMP
0.001 PC1 SW1 ICMP
0.002 SW1 PC2 ICMP
0.003 PC2 SW1 ICMP
0.004 SW1 PC1 ICMP
1.997 -- SW1 STP
1.998 SW1 PC3 STP
1.998 SW1 PC1 STP
1.998 SW1 PC2 STP
Reset Simulation
Constant Delay
Captured to: 1.998 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Event List
Realtime
Simulation
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC1 PC2 ICMP 0.000 N 0 (edit) (delete)
Logical
Physical
PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.1.20
Pinging 192.168.1.20 with 32 bytes of data:
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time=43ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.20:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 43ms, Average = 10ms
C:\>ping 192.168.1.30
Pinging 192.168.1.30 with 32 bytes of data:
Reply from 192.168.1.30: bytes=32 time<1ms TTL=128
Reply from 192.168.1.30: bytes=32 time=1ms TTL=128
Reply from 192.168.1.30: bytes=32 time<1ms TTL=128
Reply from 192.168.1.30: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.30:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 192.168.1.30
Pinging 192.168.1.30 with 32 bytes of data:
Top
PC-PT PC1
PC-PT PC2
PC-PT PC3


File Edit Options View Tools Extensions Window Help
Logical Physical x: 1028, y: 365
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
R1
Physical Config CLI Attributes
IOS Command Line Interface
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#access-list 100 deny icmp any any
Router(config)#access-list 100 permit ip any any
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip access-group 100 in
Router(config-if)#exit
Router(config)#write memory
^
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#write memory
Building configuration...
[OK]
Router#ping 8.8.8.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
Router#ping 192.168.1.10
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


File Edit Options View Tools Extensions Window Help
Logical Physical x: 425, y: 11
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
R1
Physical Config CLI Attributes
IOS Command Line Interface
Router#
Router#
Router#enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.1.254 255.255.255.0
Router(config-if)#ip pim sparse-dense-mode
^
% Invalid input detected at '^' marker.
Router(config-if)#ip pin sparse-dense-mode
^
% Invalid input detected at '^' marker.
Router(config-if)#ip multicast-routing
^
% Invalid input detected at '^' marker.
Router(config-if)#show ip pim neighbor
^
% Invalid input detected at '^' marker.
Router(config-if)#exit
Router(config)#ip pim sparse-dense-mode
^
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


Time: 01:39:52
Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1360, y: 622
2911
2960-24TT
SW1
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
R1
Physical Config CLI Attributes
IOS Command Line Interface
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip pim neighbor
^
% Invalid input detected at '^' marker.
Router#enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip igmp join-group 239.1.1.1
^
% Invalid input detected at '^' marker.
Router(config-if)#exit
Router(config)#show ip igmp groups
^
% Invalid input detected at '^' marker.
Router(config)#access-list 10 permit 239.1.1.1
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip igmp access-group 10
^
% Invalid input detected at '^' marker.
Router(config-if)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Time: 01:40:12
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC1 PC2 ICMP 0.000 N 0 (edit)
Successful PC2 PC3 ICMP 0.000 N 1 (edit)
Successful PC1 PC2 ICMP 0.000 N 2 (edit)



CONCLUSION

Cet exercice a permis d'analyser deux protocoles clés des réseaux :

1. Rôle d'ICMP dans le diagnostic réseau :

Les manipulations ont confirmé l'utilité d'ICMP pour le dépannage réseau, notamment à travers des outils comme ping (vérification de connectivité) ou traceroute (identification des routes)..

2. Configuration d'IGMP et limites des tests multicast :

La configuration d'IGMP a permis d'observer la gestion des flux multicast, essentiels pour des applications de diffusion vidéo ou de streaming.

Cependant, les tests pratiques n'ont pas pleinement validé l'optimisation de la bande passante : des duplications de paquets ont persisté, probablement en raison d'une configuration incomplète des équipements (ex. : routeurs non compatibles, règles de filtrage non ajustées) ou d'un manque de prise en charge multicast sur certains segments du réseau.