Faculté des Sciences et Technologies

(FST)

Rapport du travail de Laboratoire Nº 6 _Réseaux I

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Niveau : L3

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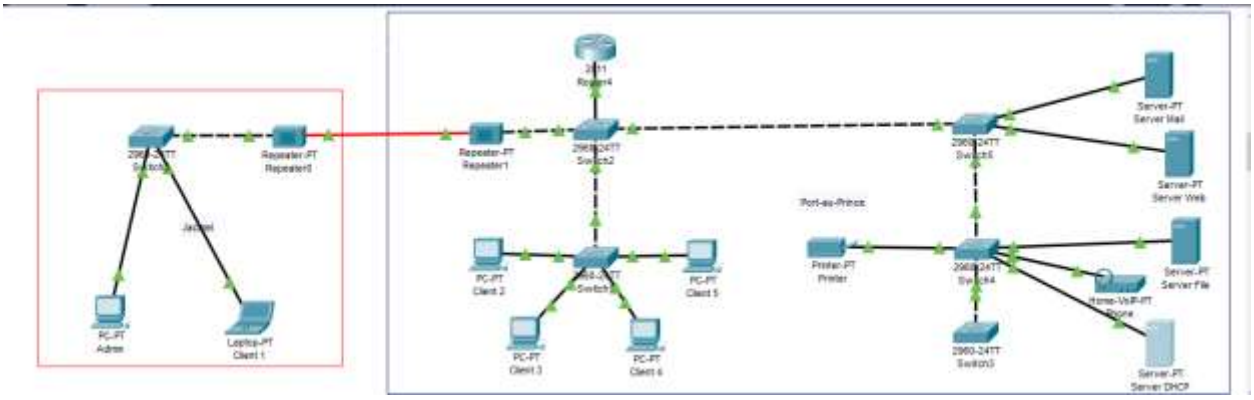
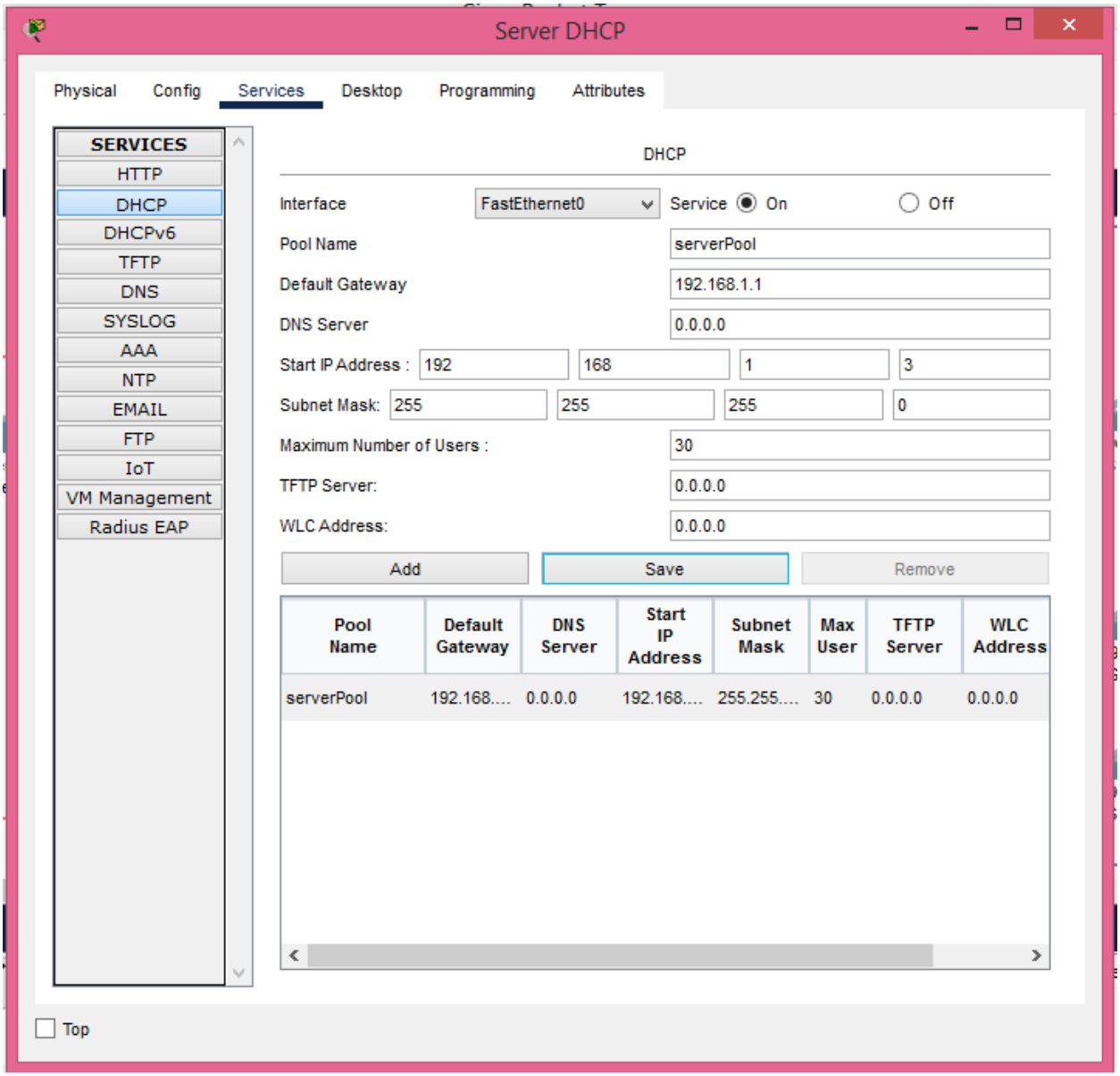
L’objectif de ce TD est de :

- Comprendre le fonctionnement du DHCP dans un réseau multi-LAN.
- Mettre en place un serveur DHCP centralisé.
- Configurer un routeur pour relayer les requêtes DHCP entre réseaux différents.
- Configurer le service DHCP directement sur un routeur.
- Vérifier l’attribution automatique d’adresses IP dans chaque LAN.
- Comprendre l’adressage IPv6 et le rôle de DHCPv6.
- Configurer un routeur comme serveur DHCPv6.
- Attribuer automatiquement des adresses IPv6 aux hôtes.
- Découvrir l’attribution automatique d’adresses IPv6 via DHCPv6.
- Configurer un serveur DHCPv6 dans un seul réseau local.
- Vérifier la communication entre les réseaux en IPv6.

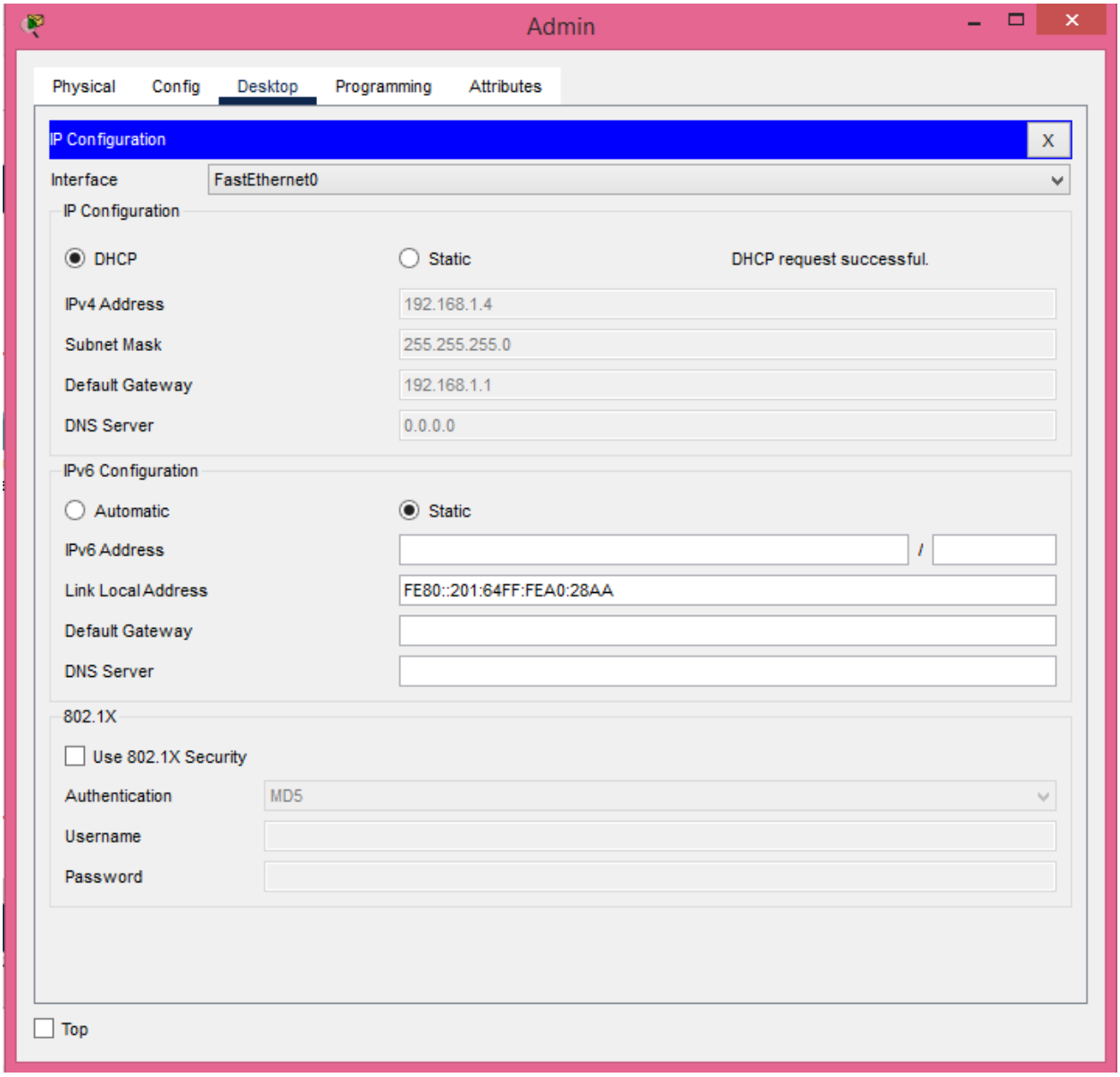
1. Reproduisez cette topologie en configurant les services DHCP afin d'attribuer automatiquement les adresses IP aux dispositifs du reseau :

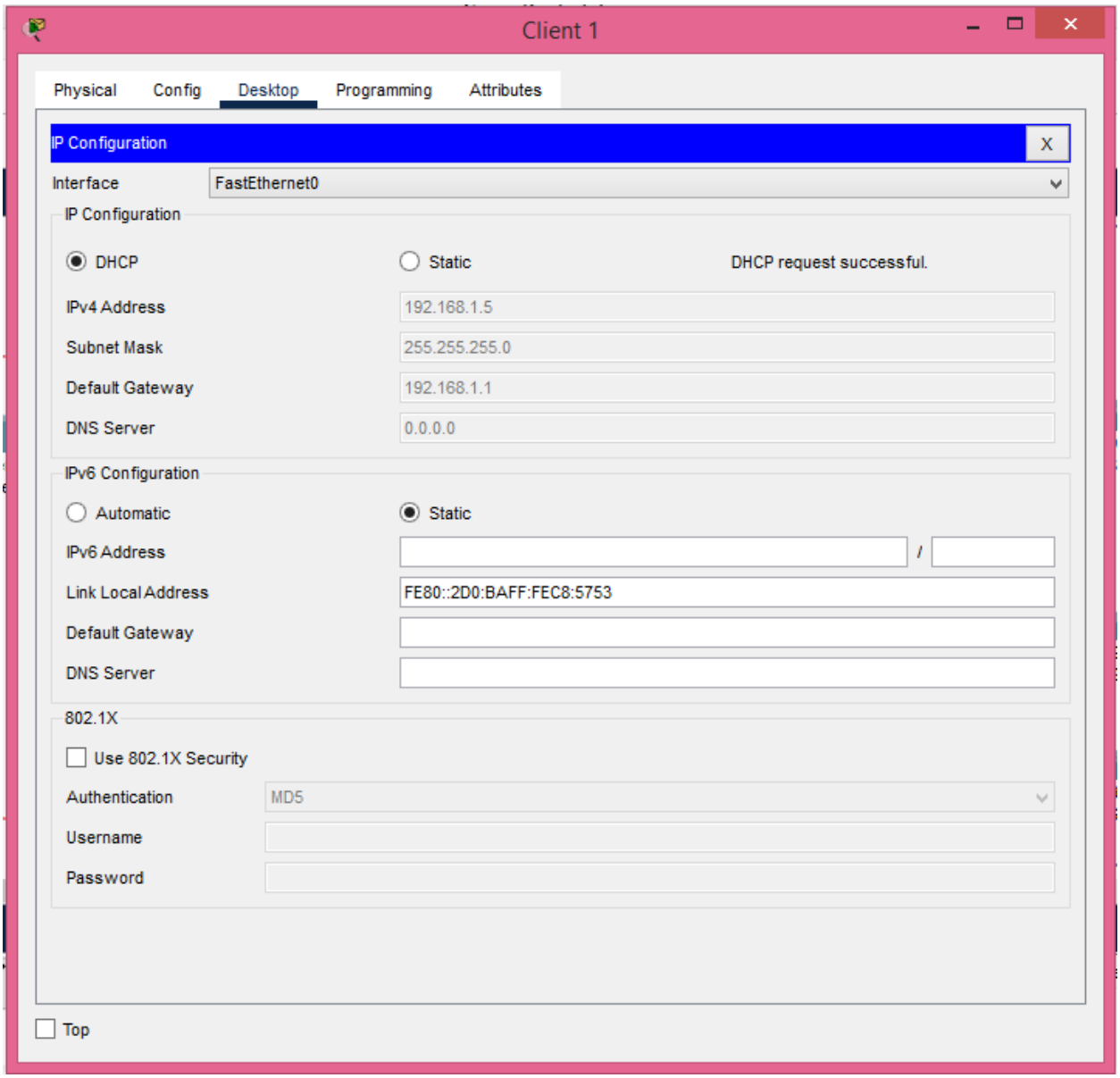


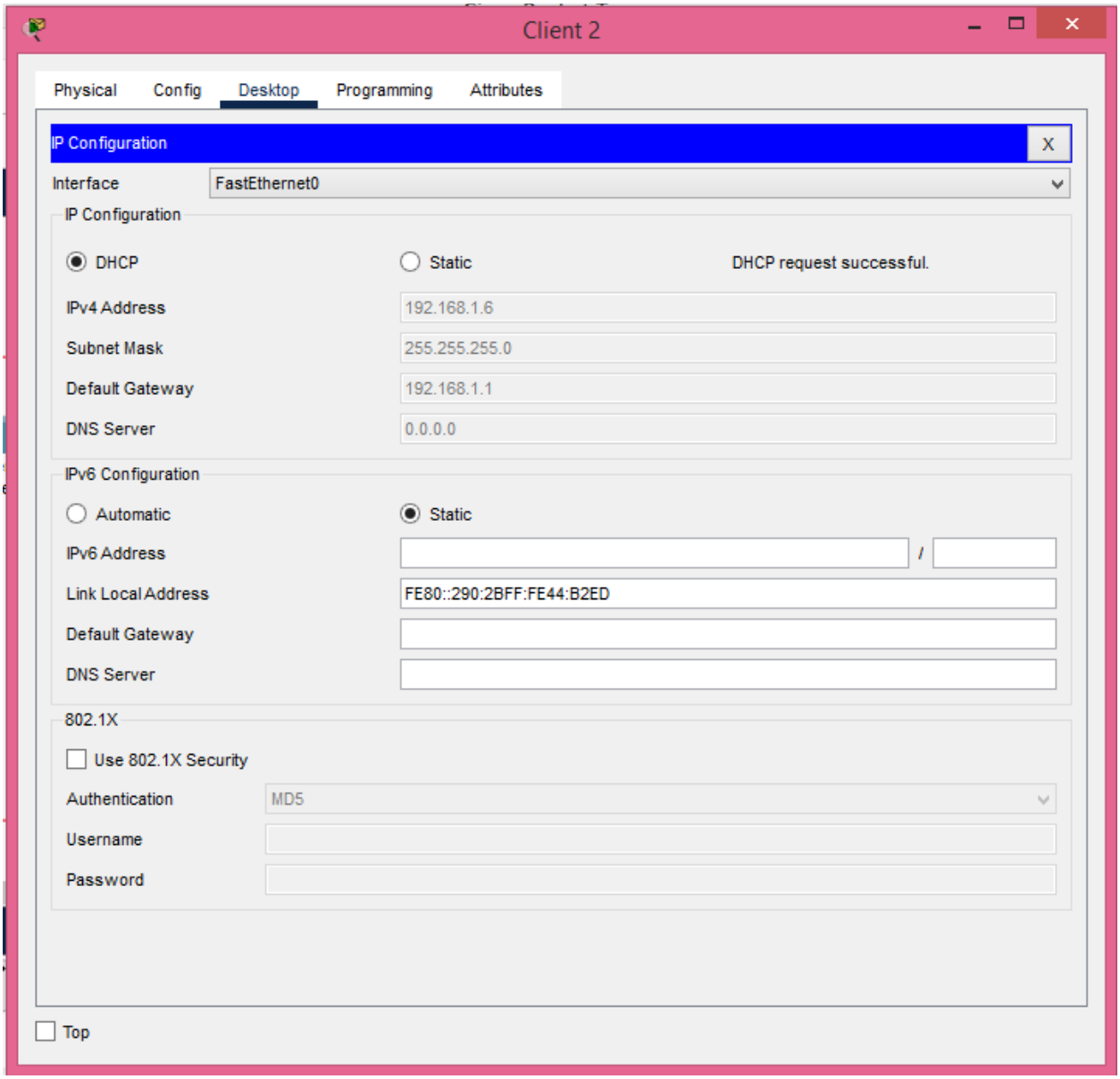
- *Configuration du serveur DHCP*

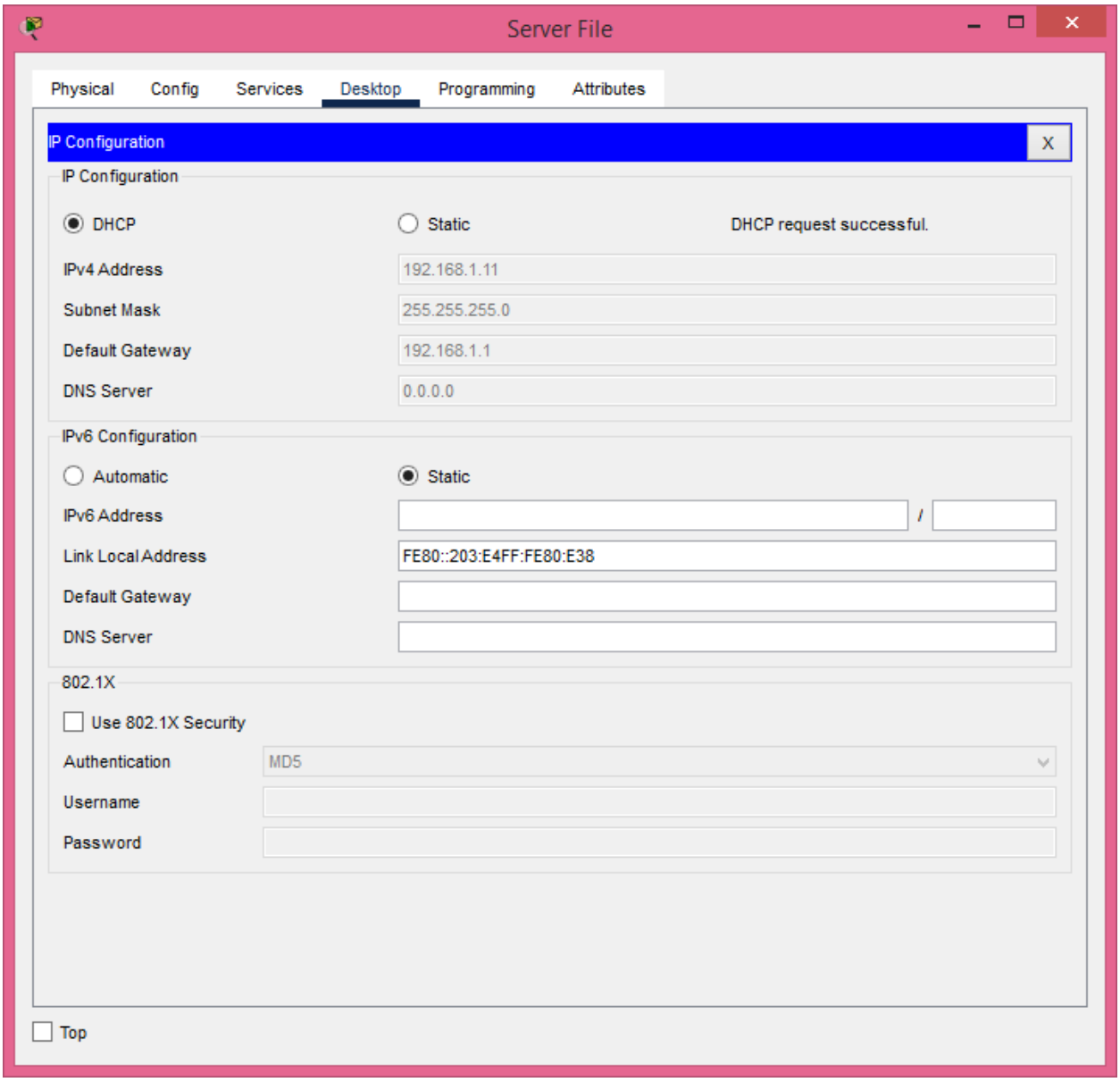


- *Attribution des ip address ipv4 par le serveur DHCP*

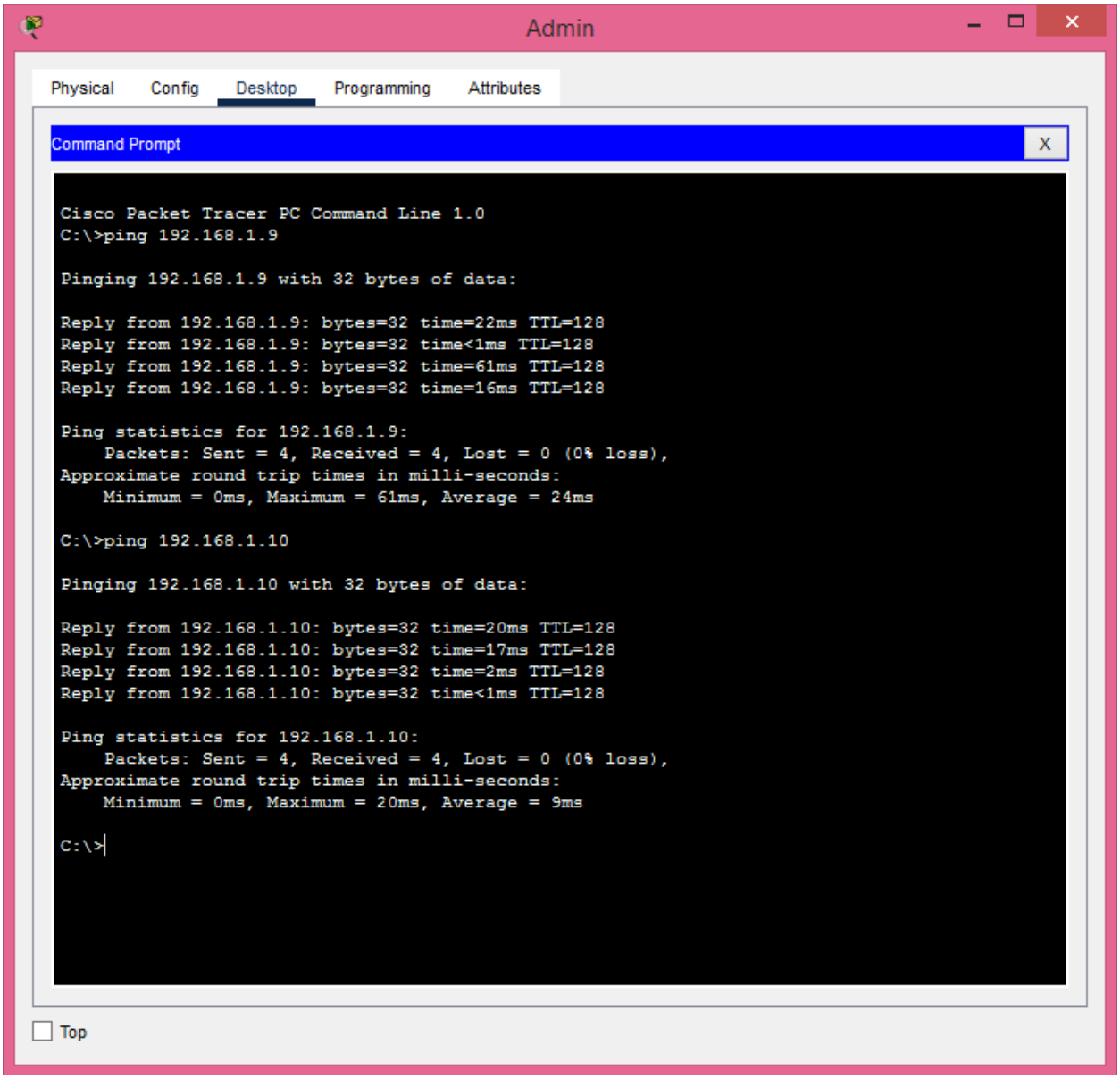


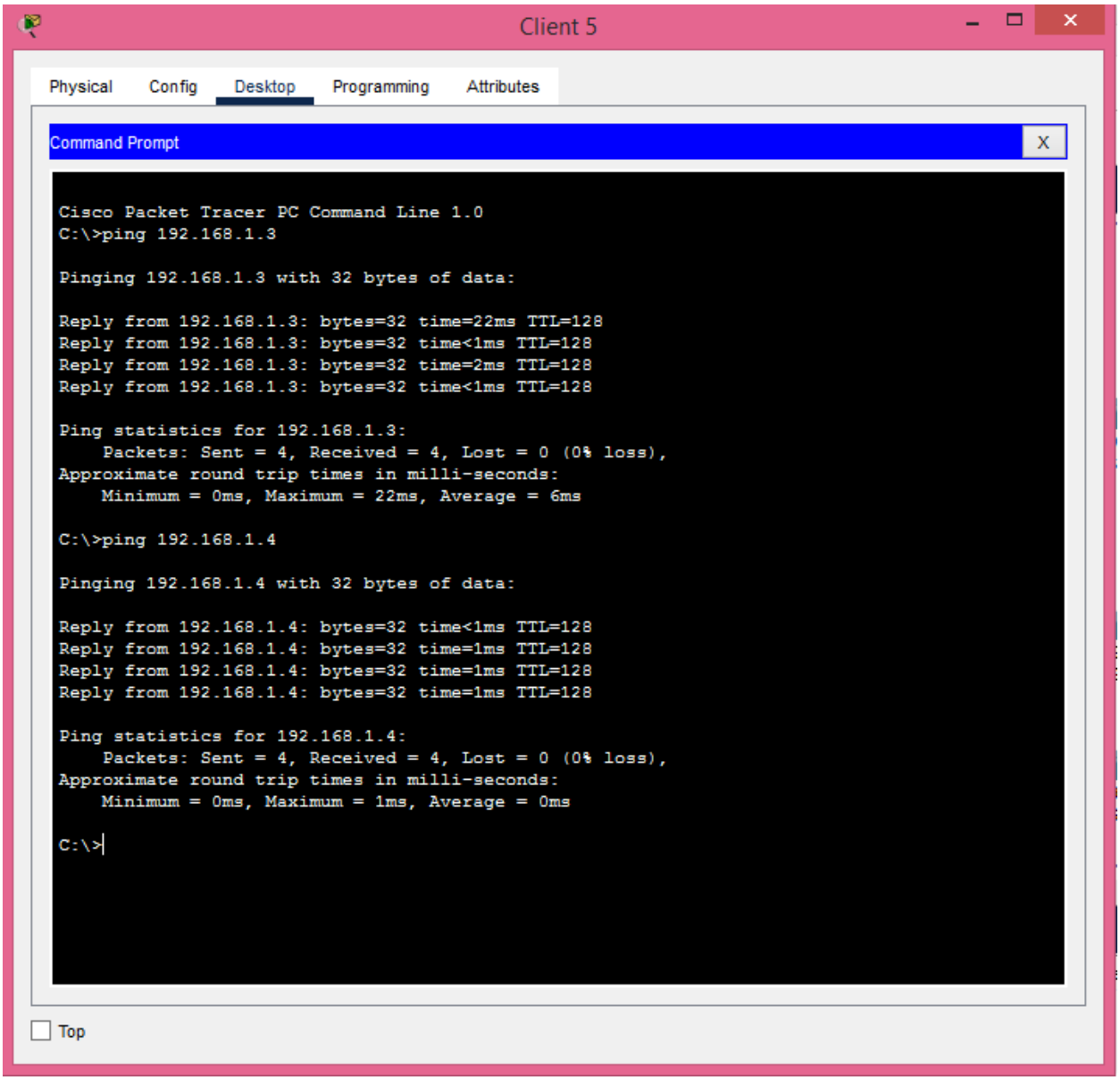

Client 1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.5
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::2D0:BAFF:FEC8:5753
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


Client 2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.6
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::290:2BFF:FE44:B2ED
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

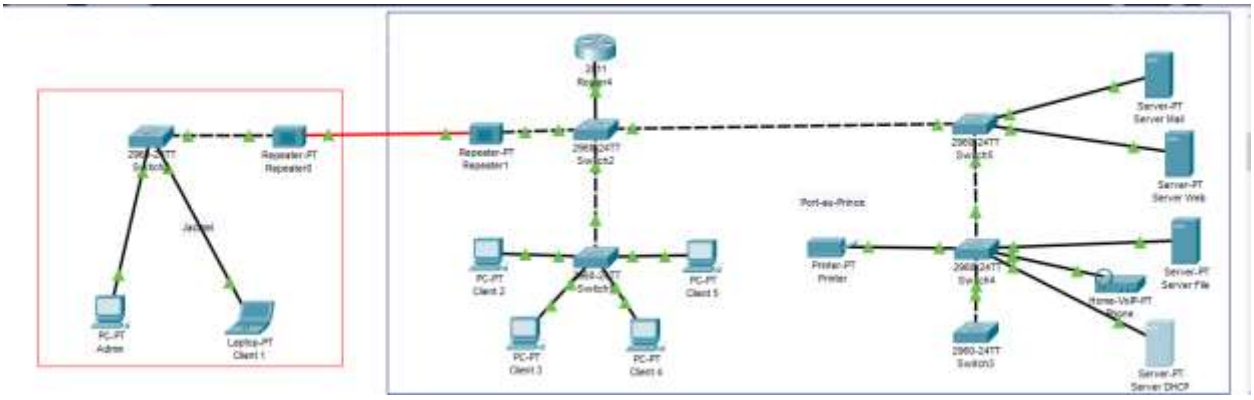

Server File
Physical
Config
Services
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.11
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::203:E4FF:FE80:E38
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

- *Test*

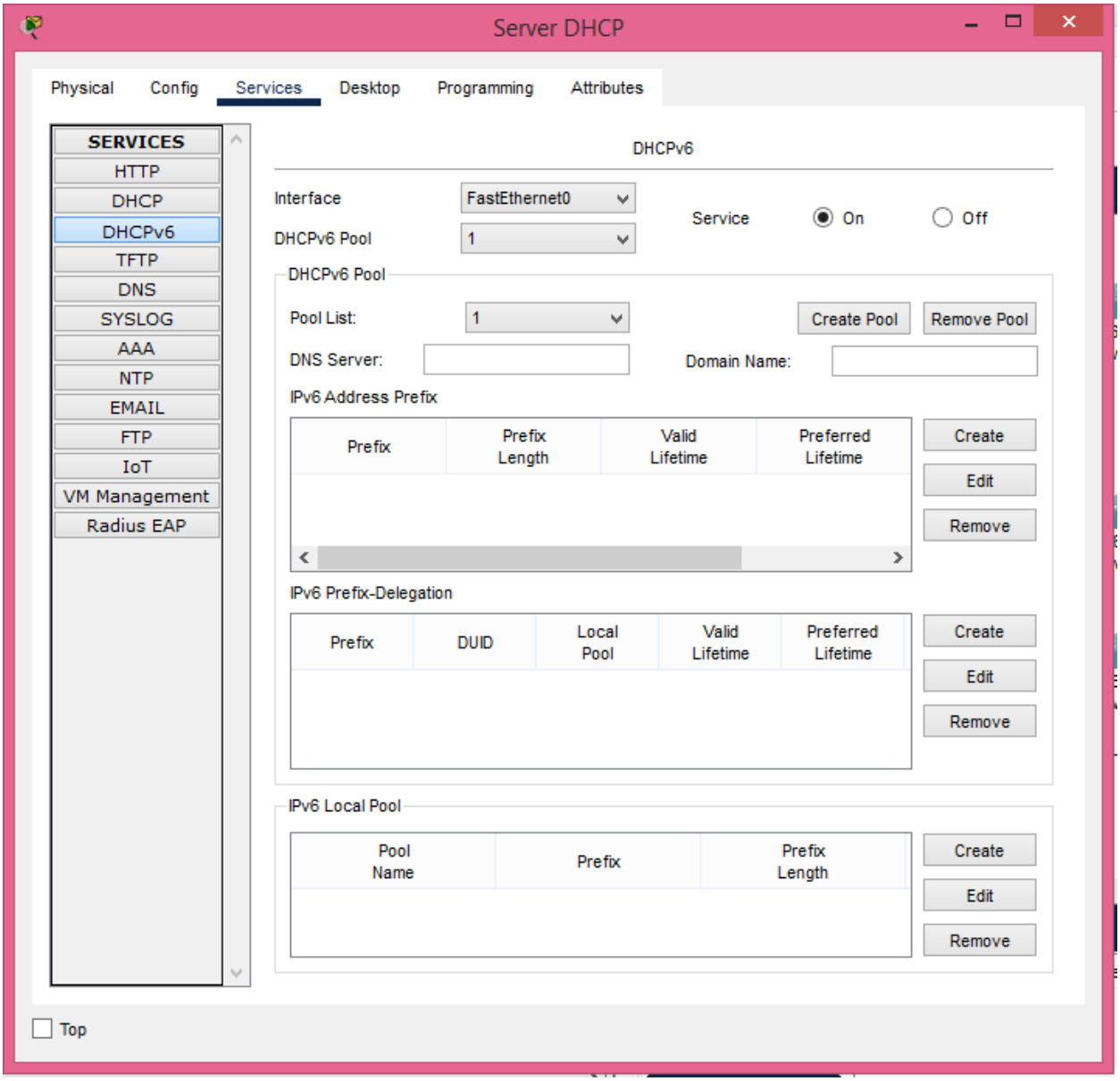

Admin
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.9
Pinging 192.168.1.9 with 32 bytes of data:
Reply from 192.168.1.9: bytes=32 time=22ms TTL=128
Reply from 192.168.1.9: bytes=32 time<1ms TTL=128
Reply from 192.168.1.9: bytes=32 time=61ms TTL=128
Reply from 192.168.1.9: bytes=32 time=16ms TTL=128
Ping statistics for 192.168.1.9:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 61ms, Average = 24ms
C:\>ping 192.168.1.10
Pinging 192.168.1.10 with 32 bytes of data:
Reply from 192.168.1.10: bytes=32 time=20ms TTL=128
Reply from 192.168.1.10: bytes=32 time=17ms TTL=128
Reply from 192.168.1.10: bytes=32 time=2ms TTL=128
Reply from 192.168.1.10: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 20ms, Average = 9ms
C:\>
Top


Client 5
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.3
Pinging 192.168.1.3 with 32 bytes of data:
Reply from 192.168.1.3: bytes=32 time=22ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=2ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 22ms, Average = 6ms
C:\>ping 192.168.1.4
Pinging 192.168.1.4 with 32 bytes of data:
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Ping statistics for 192.168.1.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
Top

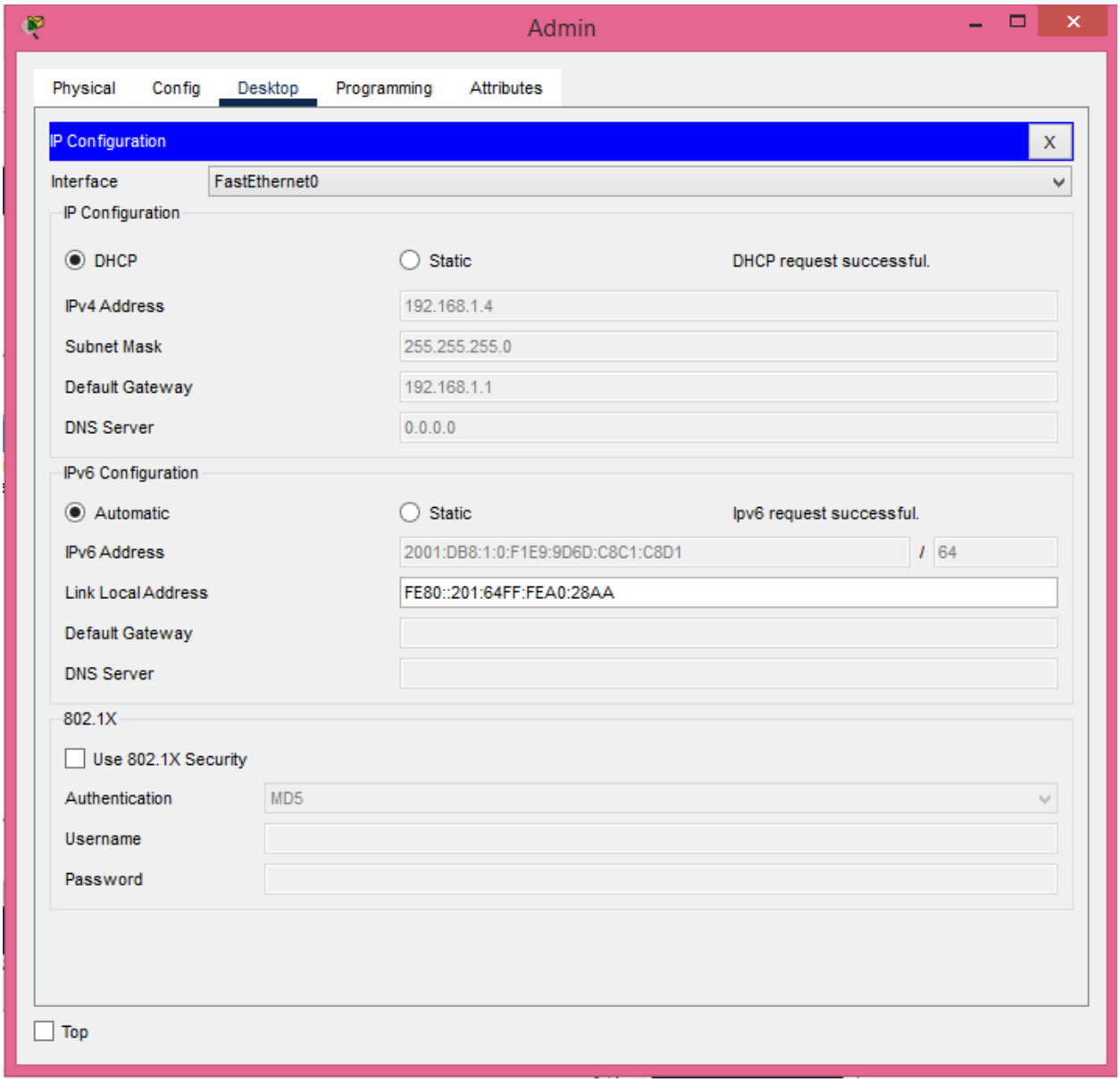
2. Reproduisez cette topologie en configurant les services DHCPv6 afin d'attribuer automatiquement les adresses IP aux dispositifs du réseau.

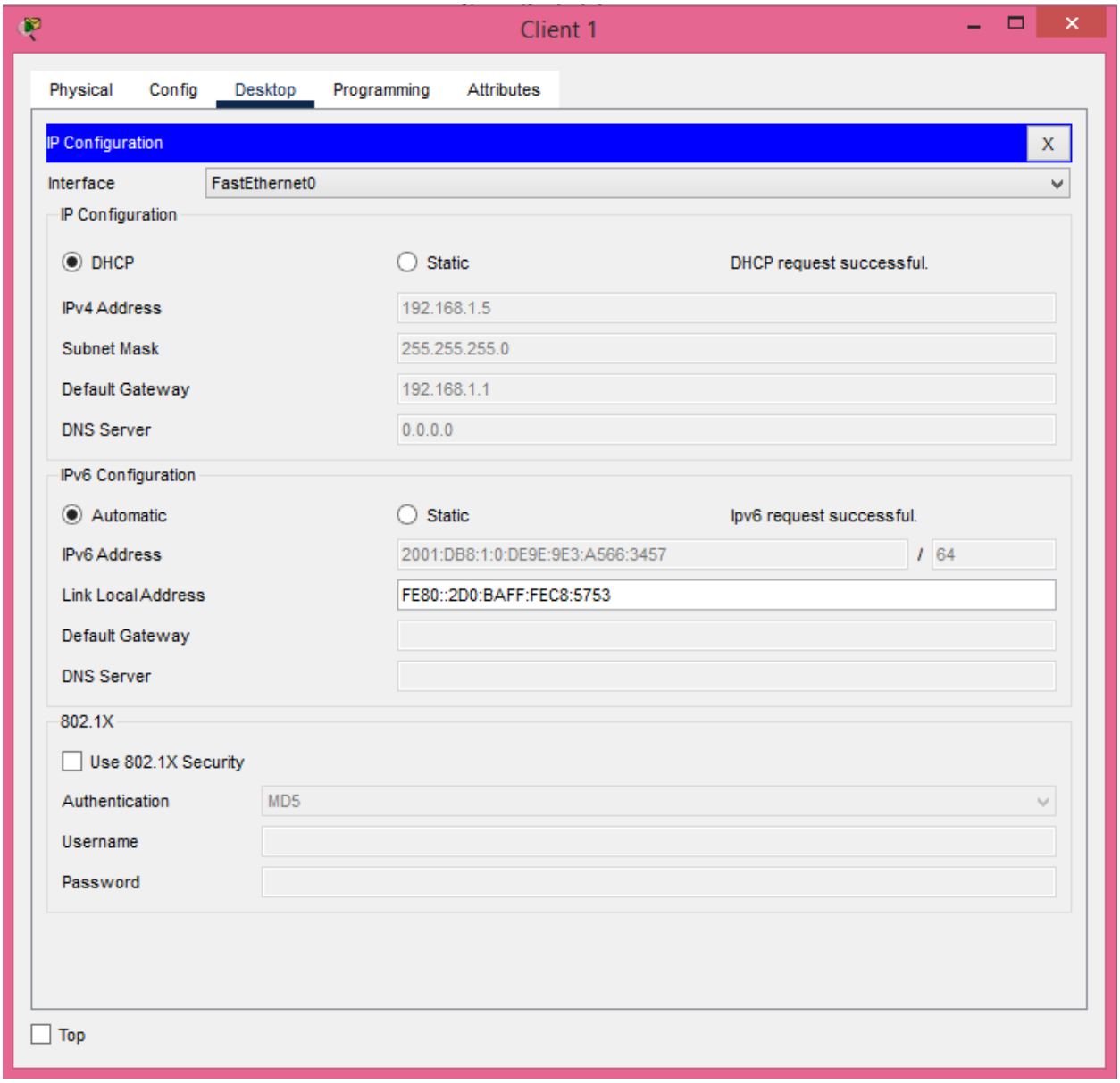


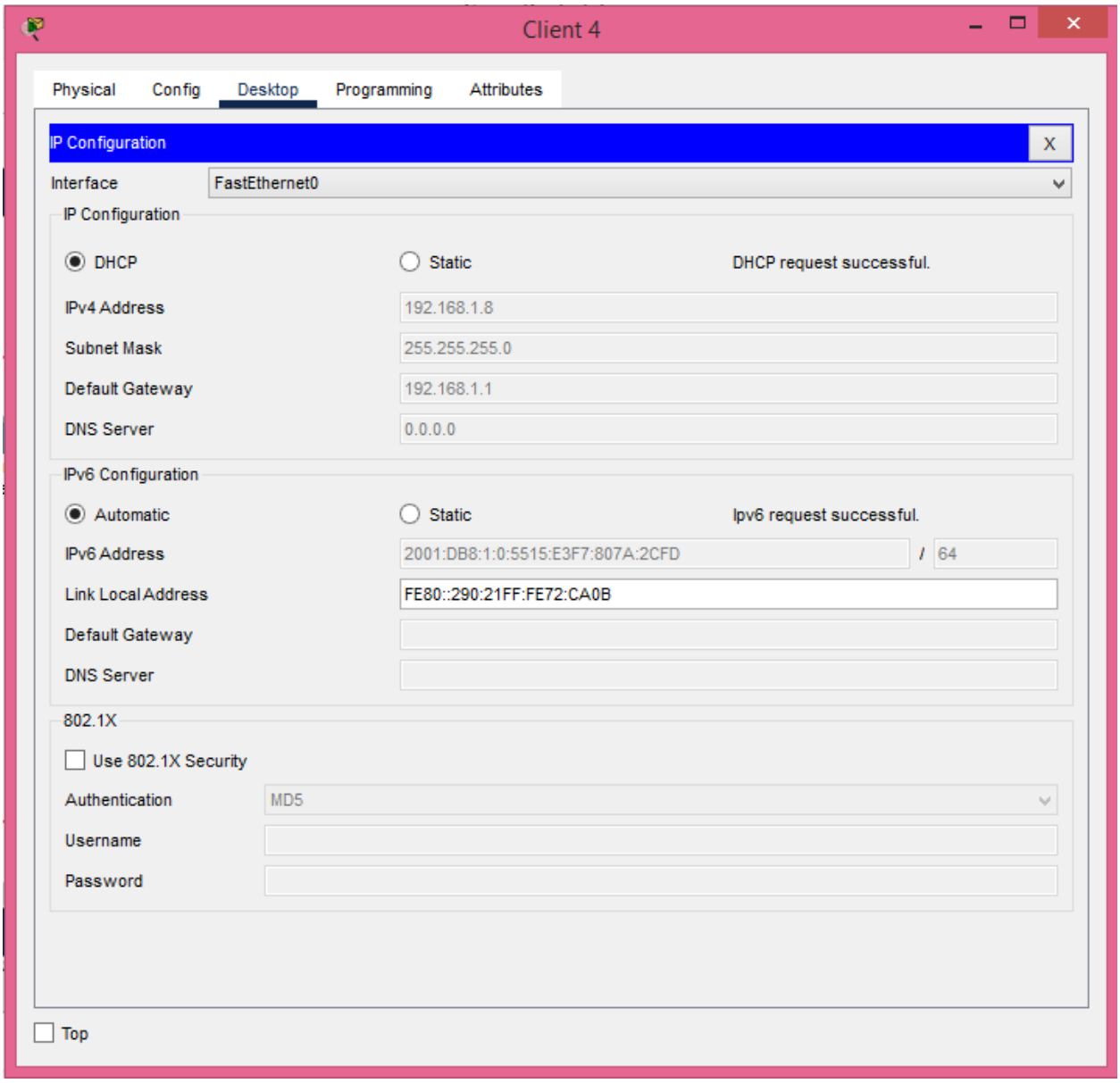
- *Configuration du serveur DHCPv6*



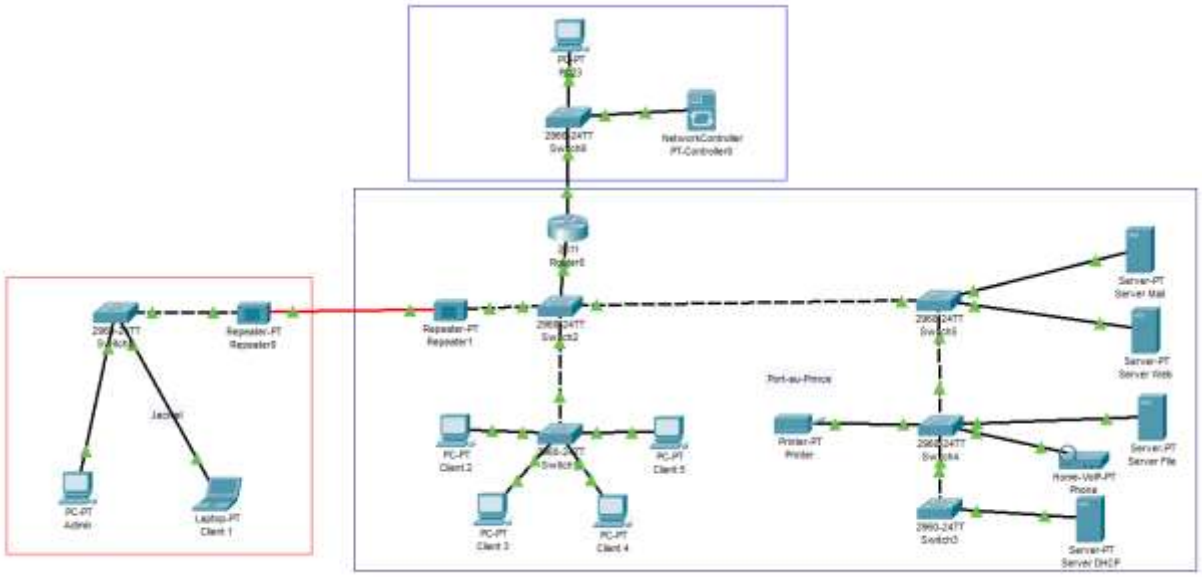
- *Attribution des ip address ipv6 par le serveur DHCPv6*


Admin
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.4
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
Ipv6 request successful.
IPv6 Address
2001:DB8:1:0:F1E9:9D6D:C8C1:C8D1
/
64
Link Local Address
FE80::201:64FF:FEA0:28AA
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

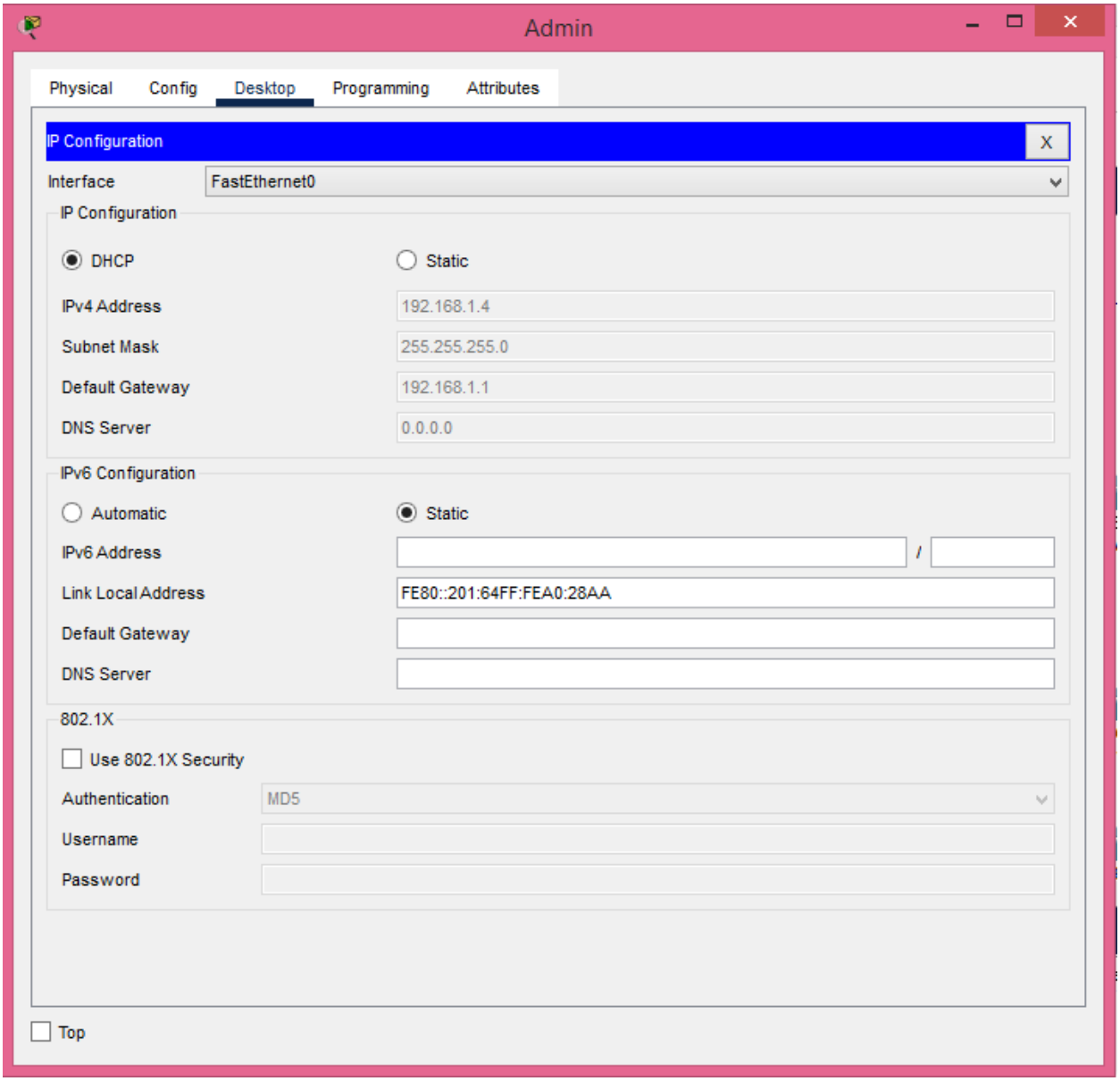

Client 1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.5
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
Ipv6 request successful.
IPv6 Address
2001:DB8:1:0:DE9E:9E3:A566:3457
/
64
Link Local Address
FE80::2D0:BAFF:FEC8:5753
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

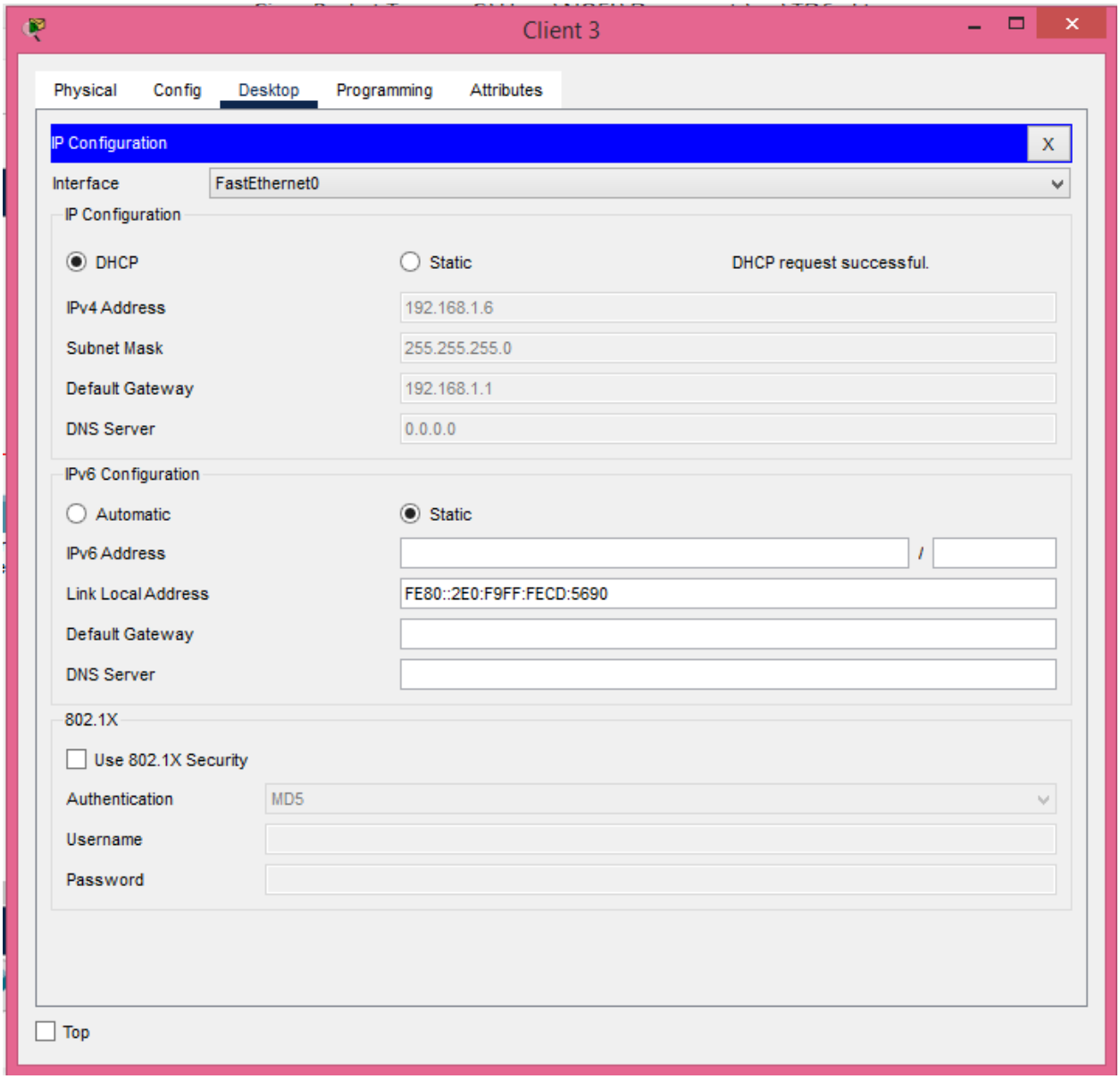

Client 4
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.8
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
Ipv6 request successful.
IPv6 Address
2001:DB8:1:0:5515:E3F7:807A:2CFD
/
64
Link Local Address
FE80::290:21FF:FE72:CA0B
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

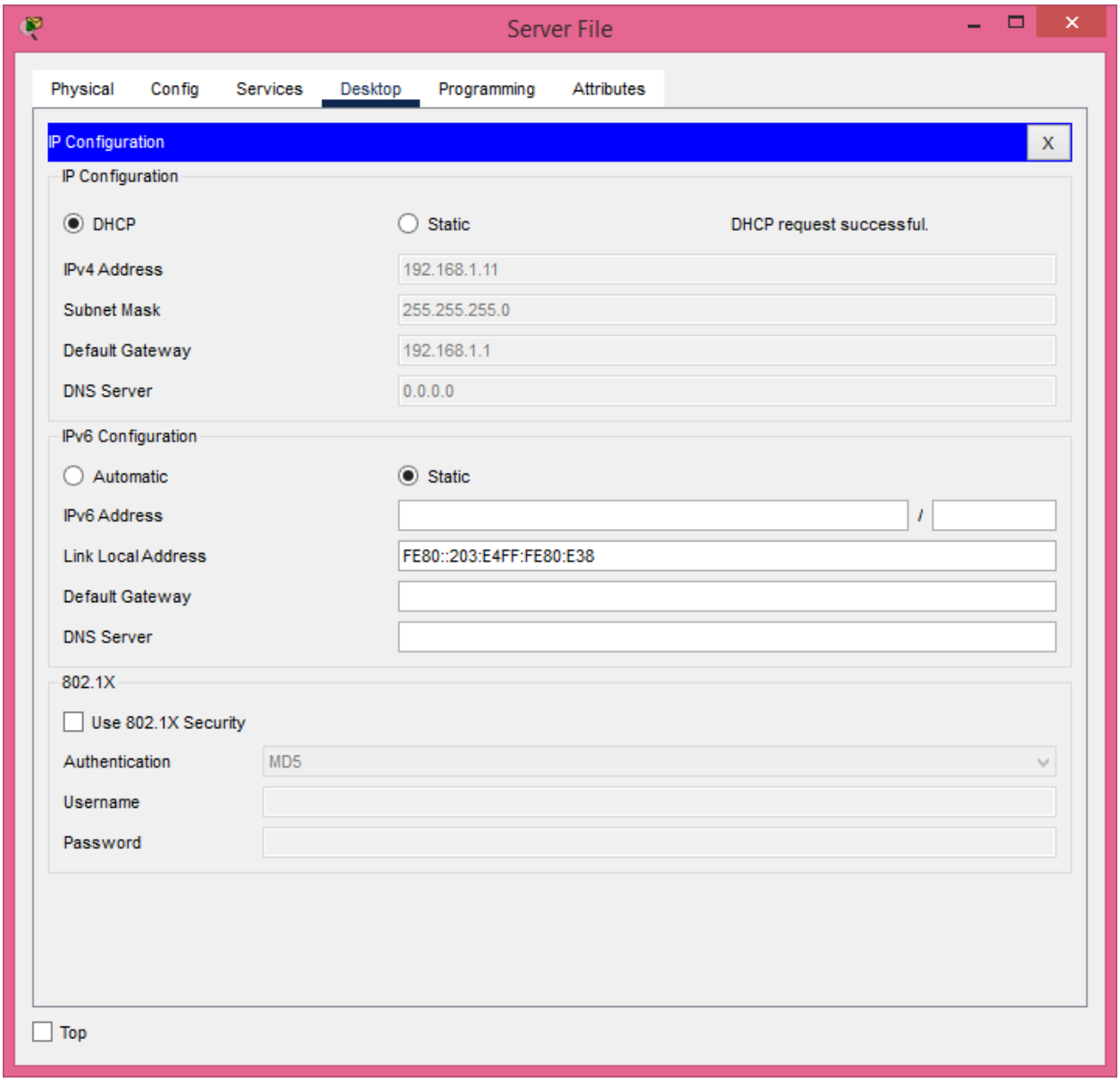
3. Reproduisez cette topologie en configurant les services DHCP, en utilisant le routeur comme serveur DHCP afin d'attribuer automatiquement les adresses IP aux différents hôtes du réseau.

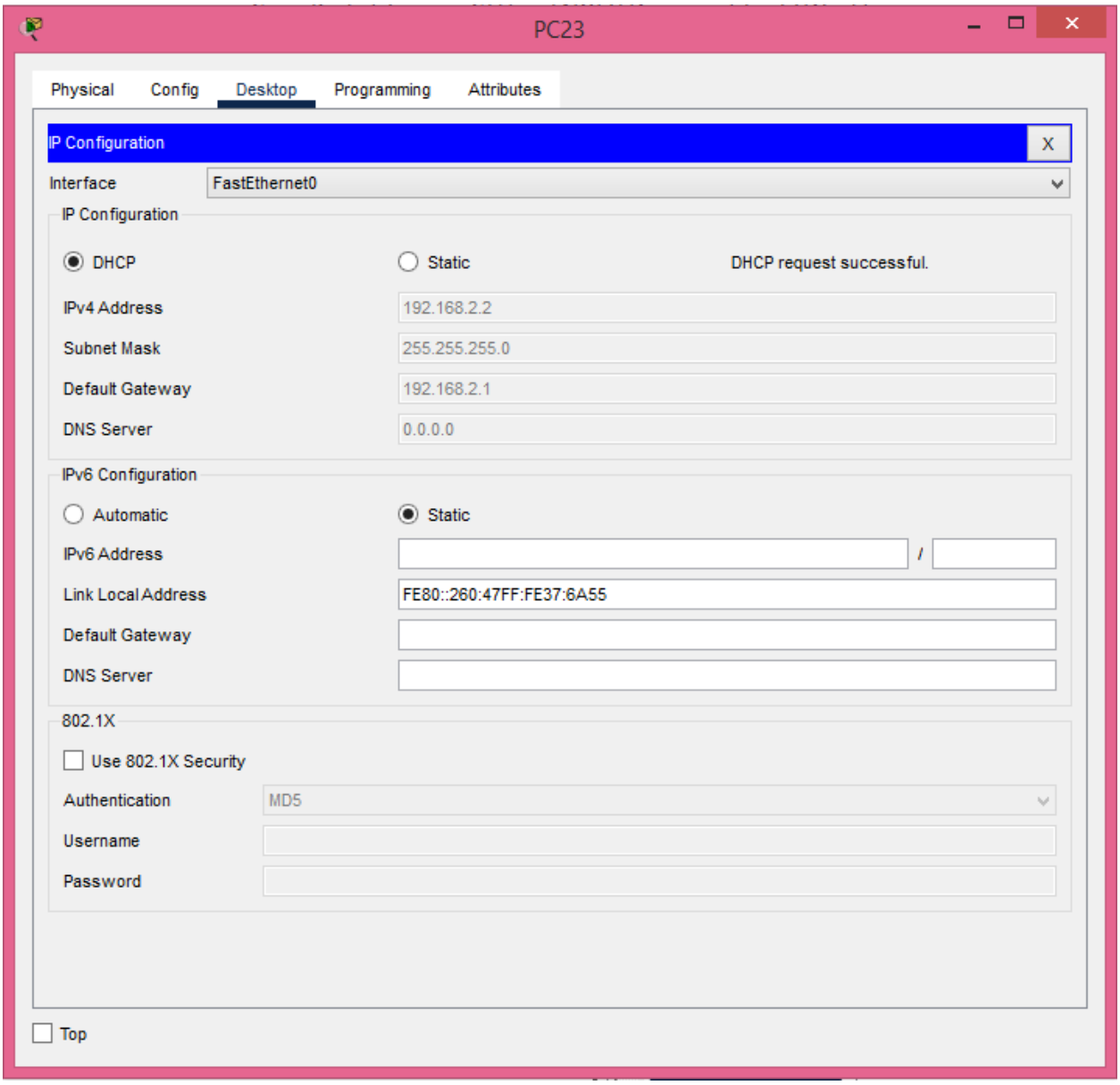


- *Attribution des ip address ipv4 par le router utilisé comme serveur DHCP.*

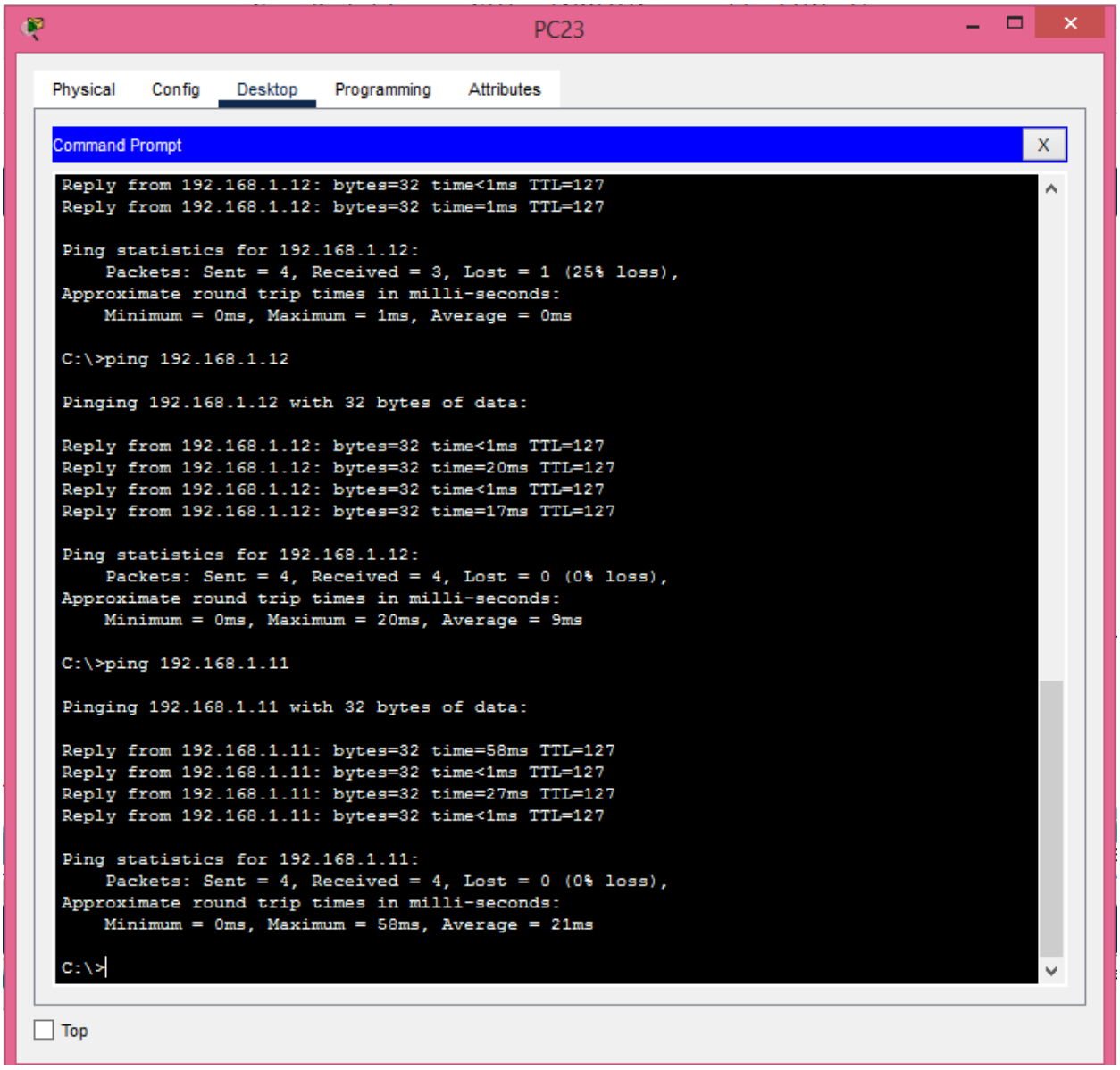


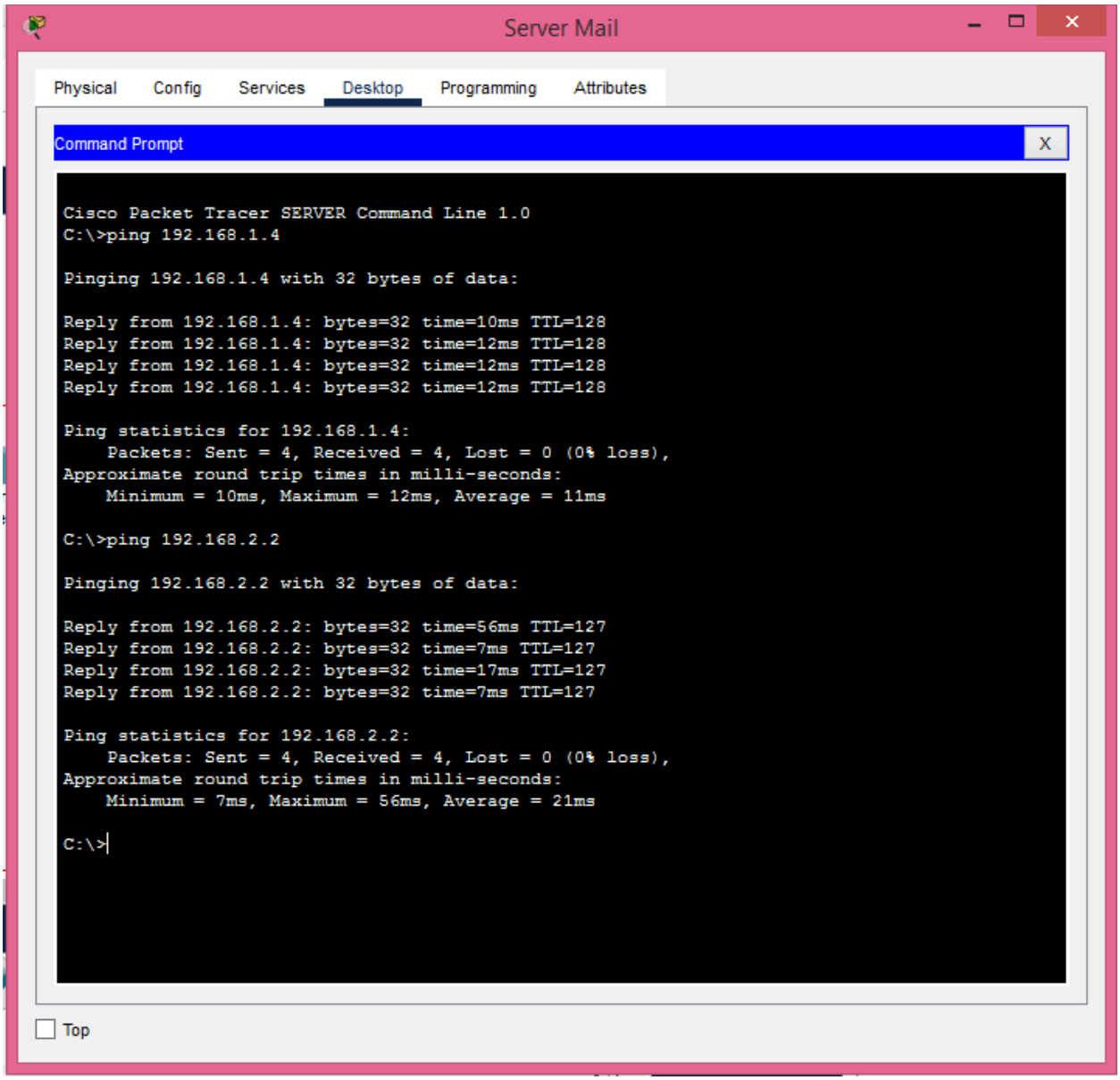

Client 3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.6
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::2E0:F9FF:FECD:5690
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


Server File
Physical
Config
Services
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
DHCP request successful.
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::203:E4FF:FE80:E38
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

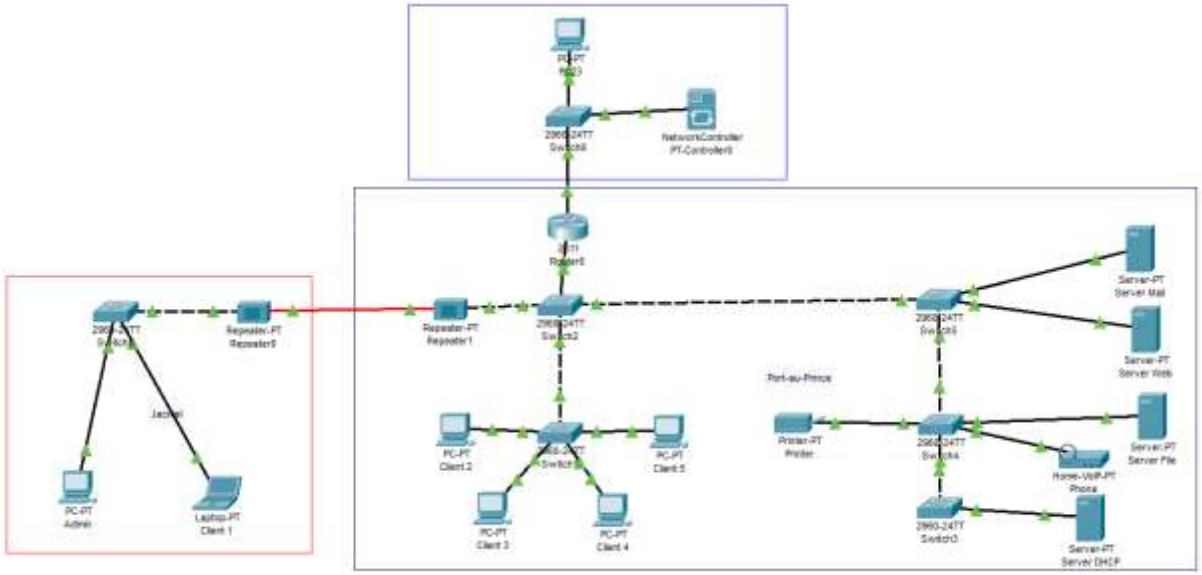

PC23
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.2.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.2.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::260:47FF:FE37:6A55
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

- *Test*

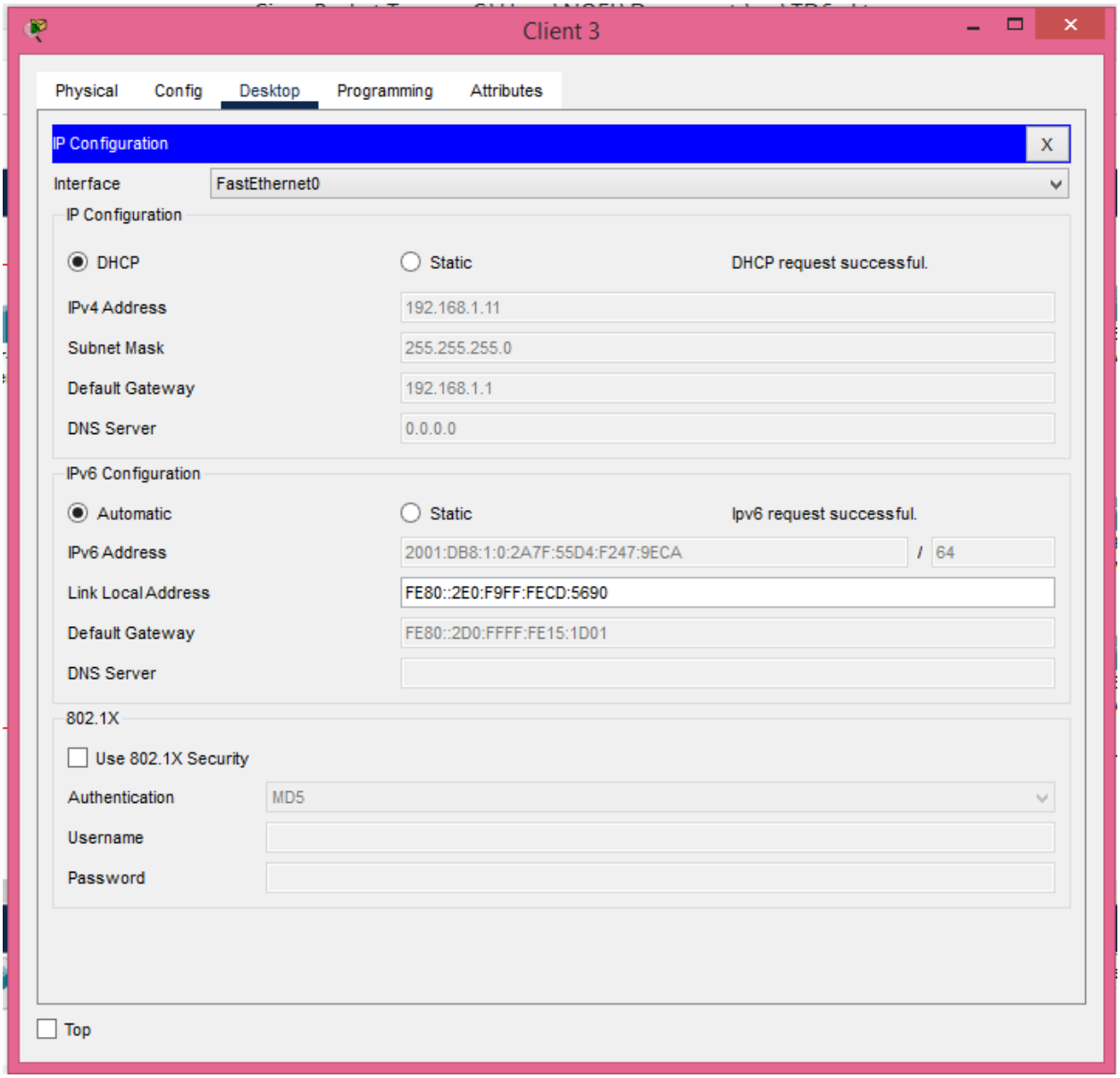

PC23
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Reply from 192.168.1.12: bytes=32 time<1ms TTL=127
Reply from 192.168.1.12: bytes=32 time=1ms TTL=127
Ping statistics for 192.168.1.12:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 192.168.1.12
Pinging 192.168.1.12 with 32 bytes of data:
Reply from 192.168.1.12: bytes=32 time<1ms TTL=127
Reply from 192.168.1.12: bytes=32 time=20ms TTL=127
Reply from 192.168.1.12: bytes=32 time<1ms TTL=127
Reply from 192.168.1.12: bytes=32 time=17ms TTL=127
Ping statistics for 192.168.1.12:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 20ms, Average = 9ms
C:\>ping 192.168.1.11
Pinging 192.168.1.11 with 32 bytes of data:
Reply from 192.168.1.11: bytes=32 time=58ms TTL=127
Reply from 192.168.1.11: bytes=32 time<1ms TTL=127
Reply from 192.168.1.11: bytes=32 time=27ms TTL=127
Reply from 192.168.1.11: bytes=32 time<1ms TTL=127
Ping statistics for 192.168.1.11:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 58ms, Average = 21ms
C:\>
Top

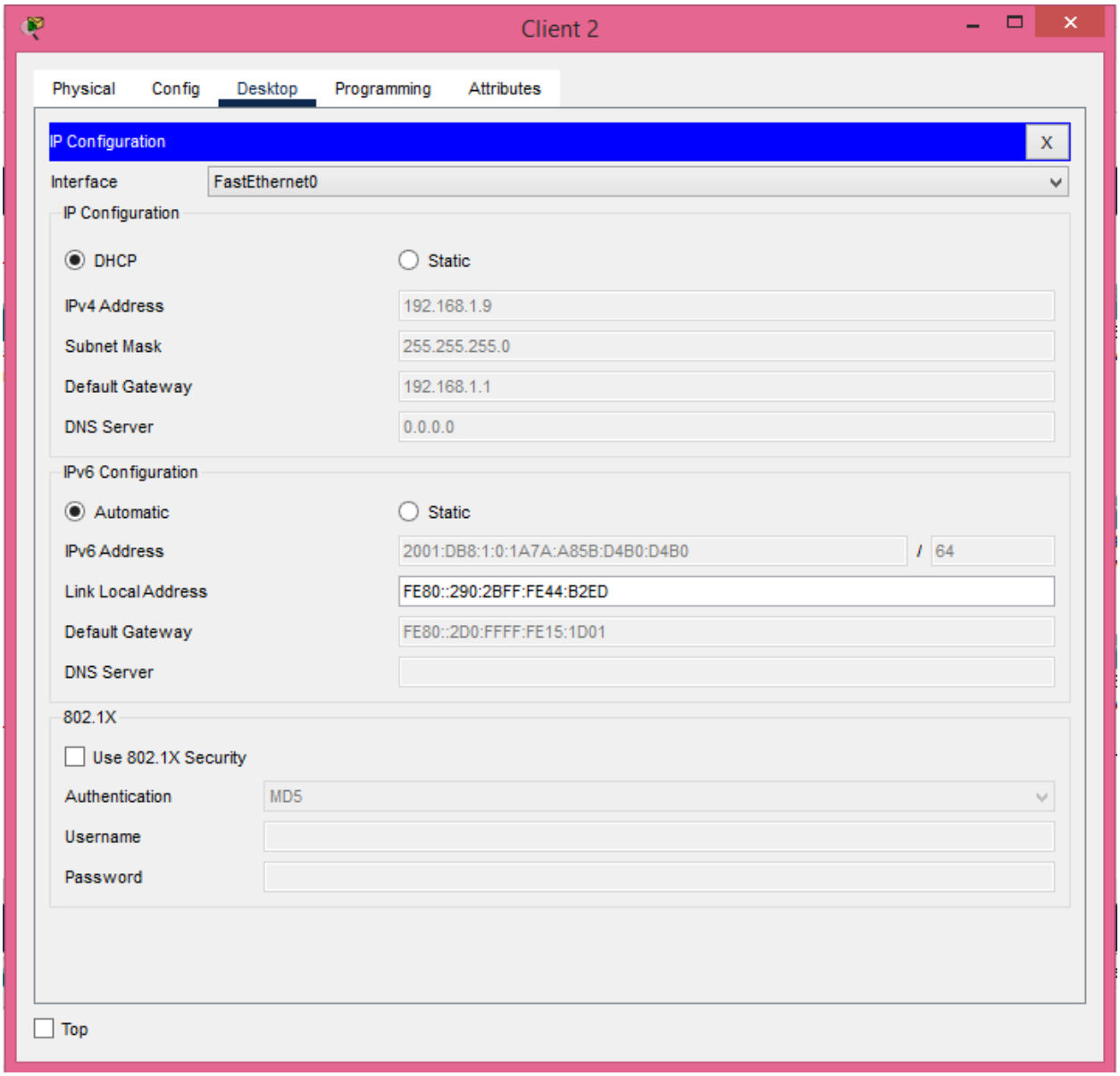

Server Mail
Physical
Config
Services
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer SERVER Command Line 1.0
C:\>ping 192.168.1.4
Pinging 192.168.1.4 with 32 bytes of data:
Reply from 192.168.1.4: bytes=32 time=10ms TTL=128
Reply from 192.168.1.4: bytes=32 time=12ms TTL=128
Reply from 192.168.1.4: bytes=32 time=12ms TTL=128
Reply from 192.168.1.4: bytes=32 time=12ms TTL=128
Ping statistics for 192.168.1.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 10ms, Maximum = 12ms, Average = 11ms
C:\>ping 192.168.2.2
Pinging 192.168.2.2 with 32 bytes of data:
Reply from 192.168.2.2: bytes=32 time=56ms TTL=127
Reply from 192.168.2.2: bytes=32 time=7ms TTL=127
Reply from 192.168.2.2: bytes=32 time=17ms TTL=127
Reply from 192.168.2.2: bytes=32 time=7ms TTL=127
Ping statistics for 192.168.2.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 56ms, Average = 21ms
C:\>
Top

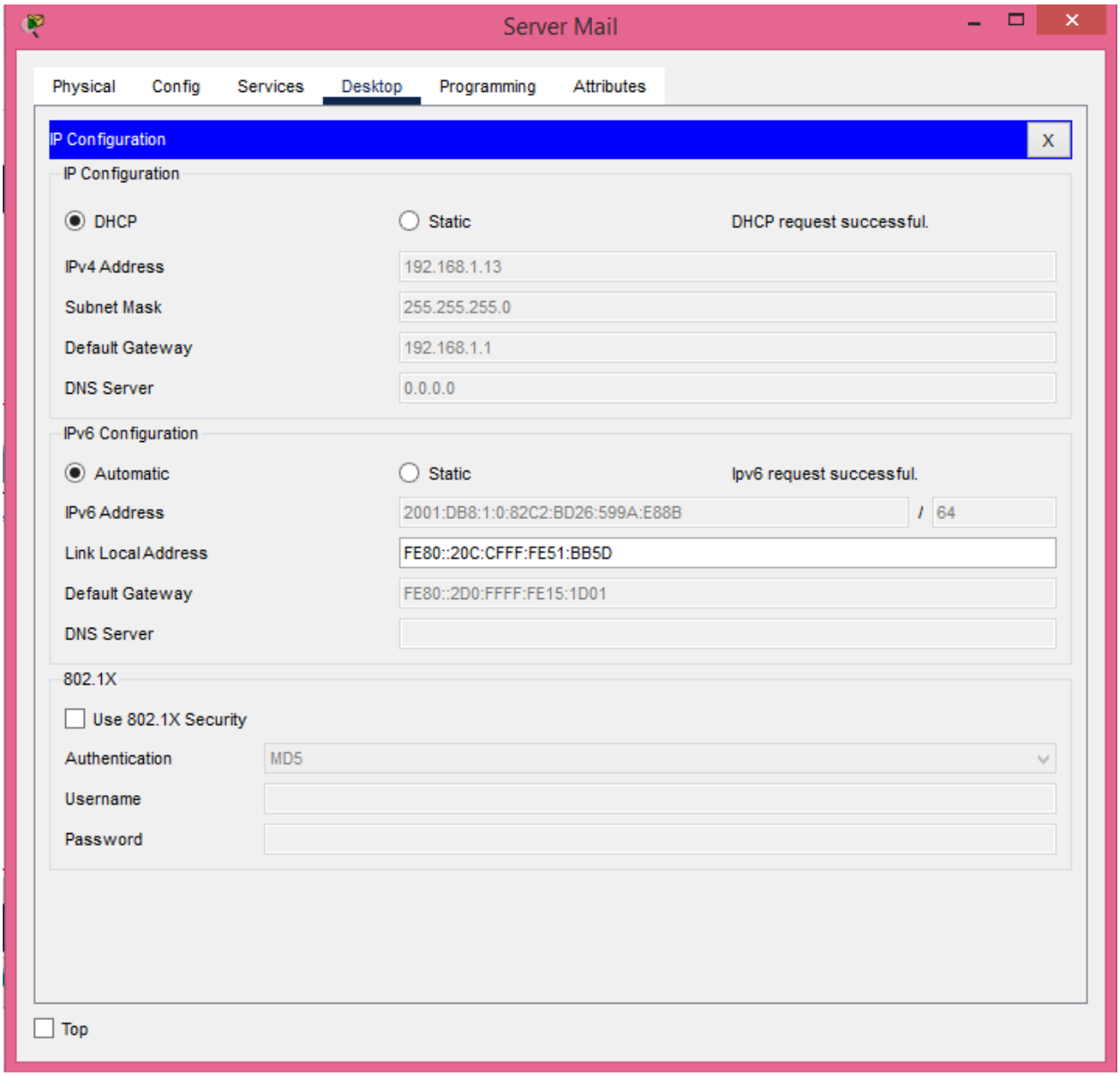
4. Reproduisez cette topologie en configurant les services DHCPv6, en utilisant le routeur comme serveur DHCP afin d'attribuer automatiquement les adresses IP aux différents hôtes du réseau.

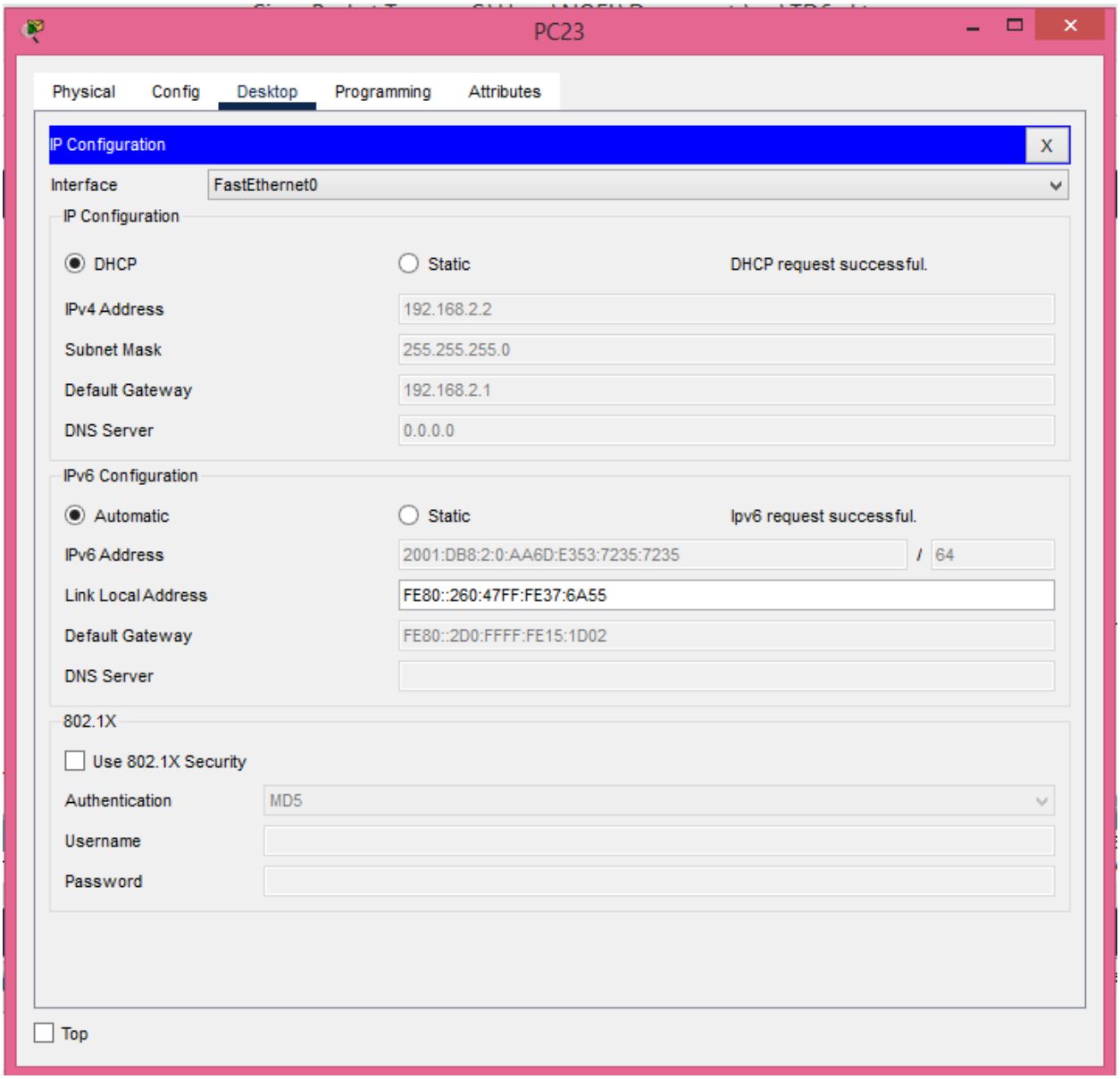


- *Attribution des ip address ipv6 par le router utilisé comme serveur DHCPv6.*

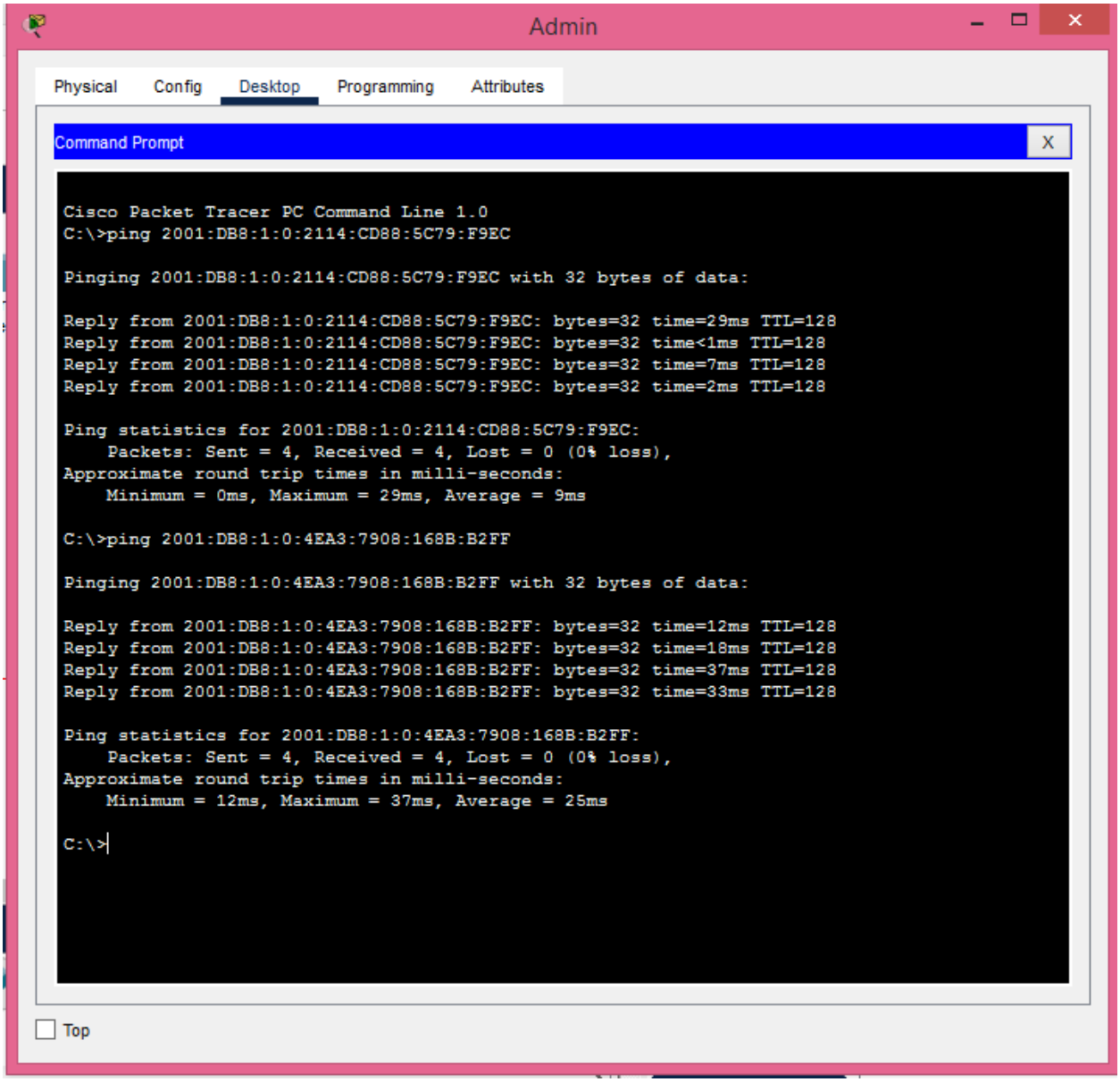


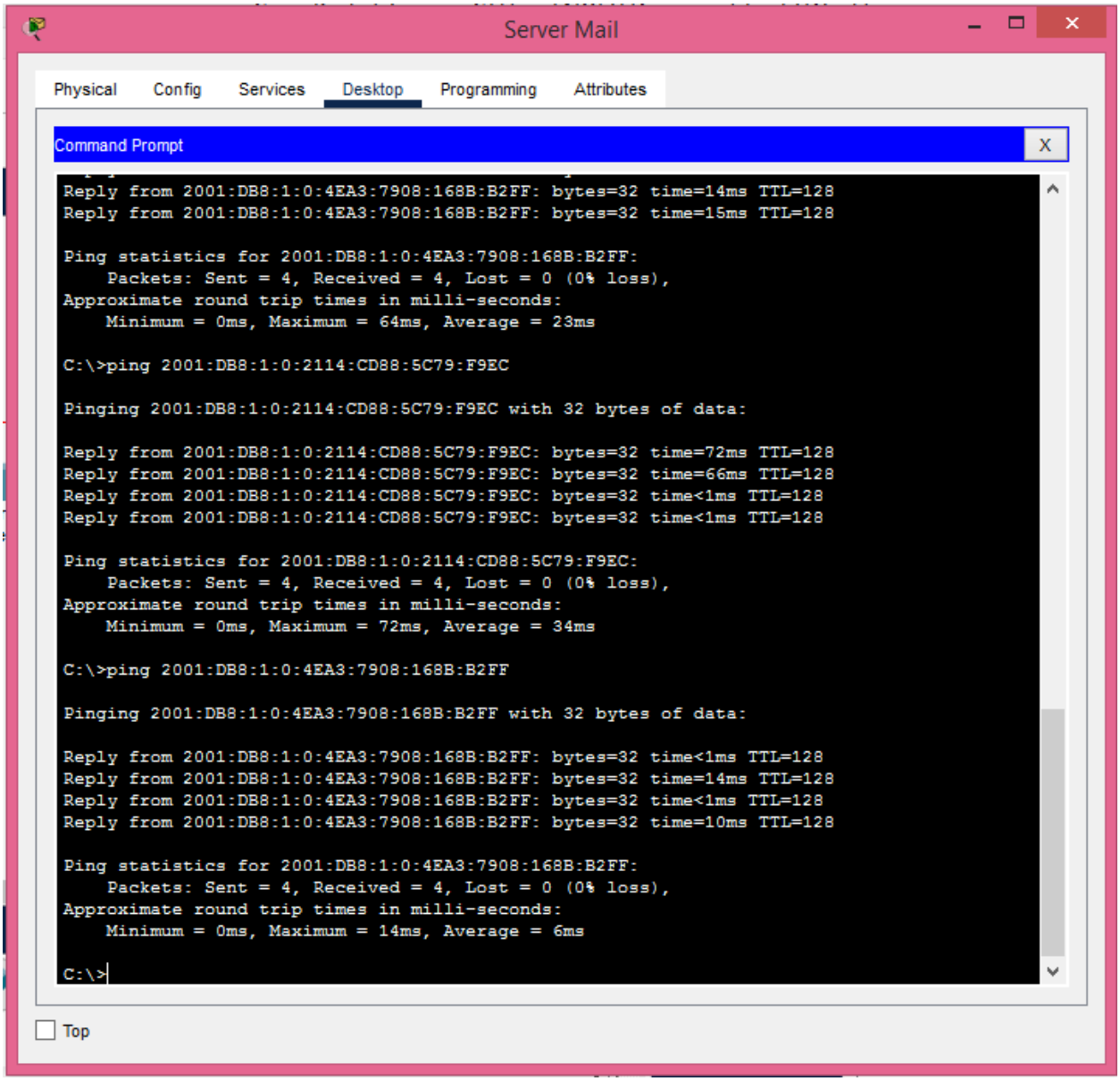

Client 2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.9
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
2001:DB8:1:0:1A7A:A85B:D4B0:D4B0
/
64
Link Local Address
FE80::290:2BFF:FE44:B2ED
Default Gateway
FE80::2D0:FFFF:FE15:1D01
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


Server Mail
Physical
Config
Services
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.1.13
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
Ipv6 request successful.
IPv6 Address
2001:DB8:1:0:82C2:BD26:599A:E88B
/
64
Link Local Address
FE80::20C:CFFF:FE51:BB5D
Default Gateway
FE80::2D0:FFFF:FE15:1D01
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


PC23
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.2.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.2.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
Ipv6 request successful.
IPv6 Address
2001:DB8:2:0:AA6D:E353:7235:7235
/
64
Link Local Address
FE80::260:47FF:FE37:6A55
Default Gateway
FE80::2D0:FFFF:FE15:1D02
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

- *Test*


Admin
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 2001:DB8:1:0:2114:CD88:5C79:F9EC
Pinging 2001:DB8:1:0:2114:CD88:5C79:F9EC with 32 bytes of data:
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time=29ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time=7ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time=2ms TTL=128
Ping statistics for 2001:DB8:1:0:2114:CD88:5C79:F9EC:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 29ms, Average = 9ms
C:\>ping 2001:DB8:1:0:4EA3:7908:168B:B2FF
Pinging 2001:DB8:1:0:4EA3:7908:168B:B2FF with 32 bytes of data:
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=12ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=18ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=37ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=33ms TTL=128
Ping statistics for 2001:DB8:1:0:4EA3:7908:168B:B2FF:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 12ms, Maximum = 37ms, Average = 25ms
C:\>
Top


Server Mail
Physical
Config
Services
Desktop
Programming
Attributes
Command Prompt
X
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=14ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=15ms TTL=128
Ping statistics for 2001:DB8:1:0:4EA3:7908:168B:B2FF:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 64ms, Average = 23ms
C:\>ping 2001:DB8:1:0:2114:CD88:5C79:F9EC
Pinging 2001:DB8:1:0:2114:CD88:5C79:F9EC with 32 bytes of data:
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time=72ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time=66ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:1:0:2114:CD88:5C79:F9EC: bytes=32 time<1ms TTL=128
Ping statistics for 2001:DB8:1:0:2114:CD88:5C79:F9EC:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 72ms, Average = 34ms
C:\>ping 2001:DB8:1:0:4EA3:7908:168B:B2FF
Pinging 2001:DB8:1:0:4EA3:7908:168B:B2FF with 32 bytes of data:
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=14ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:1:0:4EA3:7908:168B:B2FF: bytes=32 time=10ms TTL=128
Ping statistics for 2001:DB8:1:0:4EA3:7908:168B:B2FF:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 14ms, Average = 6ms
C:\>
Top

Conclusion

Ce laboratoire de réseau m'a permis de comprendre le fonctionnement du DHCP dans un environnement multi-LAN, en mettant en place un serveur DHCP centralisé pour gérer efficacement l'attribution des adresses IP. J'ai appris à configurer un routeur pour qu'il relaie les requêtes DHCP entre différents réseaux, assurant ainsi une distribution automatique et cohérente des adresses. En parallèle, j'ai exploré la configuration directe du service DHCP sur un routeur, puis vérifié que chaque LAN recevait bien ses adresses IP de manière automatique.

La deuxième partie m'a initié à l'adressage IPv6 et au rôle clé du DHCPv6. J'ai configuré un routeur comme serveur DHCPv6 pour attribuer des adresses IPv6 aux hôtes, et j'ai pu observer le processus d'attribution automatique. Enfin, j'ai validé la communication entre les réseaux en IPv6, consolidant ainsi mes connaissances sur la gestion des adresses dans des infrastructures modernes.