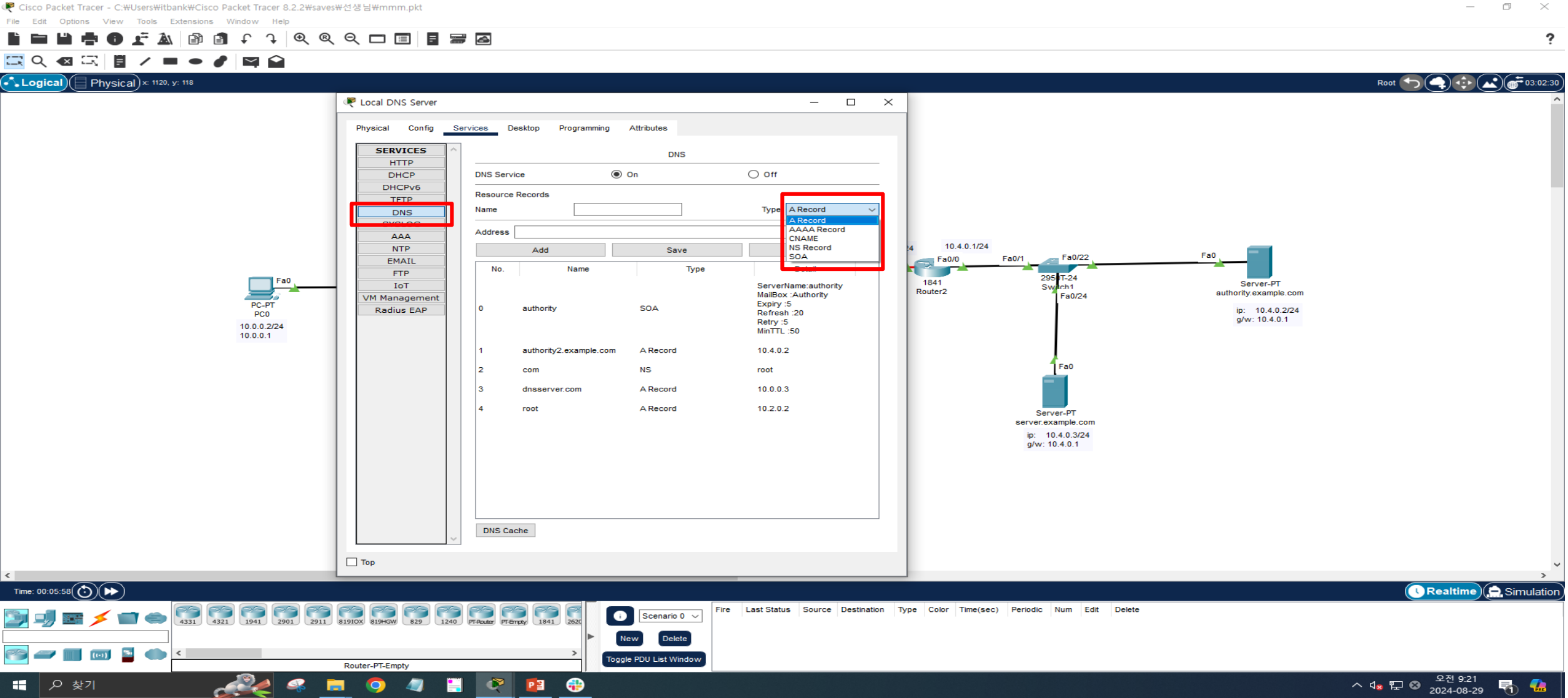
2024-08-20

네트워크

DNS


Cisco Packet Tracer - C:₩Users₩itbank₩Cisco Packet Tracer 8.2.2₩saves₩선생님₩mmm.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1120, y: 118
Root 03:02:30
Local DNS Server
Physical Config Services Desktop Programming Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service On Off
Resource Records
Name
Type A Record
A Record
AAAA Record
CNAME
NS Record
SOA
Address
Add Save
No. Name Type
0 authority SOA ServerName:authority MailBox :Authority Expiry :5 Refresh :20 Retry :5 MinTTL :50
1 authority2.example.com A Record 10.4.0.2
2 com NS root
3 dnsserver.com A Record 10.0.0.3
4 root A Record 10.2.0.2
DNS Cache
Top
Fa0
PC-PT
PC0
10.0.0.2/24
10.0.0.1
10.4.0.1/24
Fa0/0
Fa0/1
1841
Router2
Fa0/22
Fa0/24
2950T-24
Switch1
Fa0
Server-PT
authority.example.com
ip: 10.4.0.2/24
g/w: 10.4.0.1
Fa0
Server-PT
server.example.com
ip: 10.4.0.3/24
g/w: 10.4.0.1
Time: 00:05:58
Realtime Simulation
Scenario 0
New Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Router-PT-Empty
찾기
오전 9:21
2024-08-29

DNS란

DNS는 브라우저가 입력한 호스트 이름 URL에 해당하는 올바른 IP 주소를 찾을 수 있도록 하는 도메인 이름 및 IP 주소 기록 시스템

웹 사이트에 액세스하려고 할 때 일반적으로 다음과 같은 도메인 이름을 입력합니다. cdnetworks.com 또는 wired.com 또는,

웹 브라우저로. 그러나 웹 브라우저는 웹 사이트의 콘텐츠를 로드하기 위해 정확한 IP 주소를 알아야 DNS는 웹사이트의 서버에서 리소스를 로드할 수 있도록 도메인 이름을 IP 주소로 변환하는 것

네트워크 용어

A 레코드 (Address Record)

A 레코드는 도메인 이름을 IPv4 주소로 변환하는 데 사용됩니다. 예를 들어, 웹사이트의 도메인 이름 www.example.com이 어떤 IPv4 주소로 연결되는지 지정할 때 A 레코드가 사용됩니다.

네트워크 용어

AAAA 레코드 (IPv6 Address Record)

AAAA 레코드는 A 레코드와 유사하지만, IPv6 주소를 반환하는 데 사용됩니다. 즉, 도메인 이름을 IPv6 주소로 매핑하는 역할을 합니다.

네트워크 용어

CNAME 레코드 (Canonical Name Record)

CNAME 레코드는 하나의 도메인 이름을 다른 도메인 이름으로 매핑하는 데 사용됩니다. 이는 별칭을 생성할 때 유용하며, 예를 들어 www.example.com을 example.com으로 리디렉션할 때 사용할 수 있습니다. CNAME 레코드를 사용하면 여러 도메인 이름을 관리하는 것보다 한 도메인의 설정을 변경하여 여러 별칭에 영향을 줄 수 있습니다.

즉, 도메인의 또 다른 도메인 이름으로 생각하면 좋다.

A레코드와 CNAME의 차이점

- A record는 직접적으로 IP가 할당되어 있기 때문에 IP가 변경되면 직접적으로 도메인에 영향을 미치지만,
- CNAME은 도메인에 도메인이 매핑되어 있기 때문에 IP의 변경에 직접적인 영향을 받지 않는다.

네트워크 용어

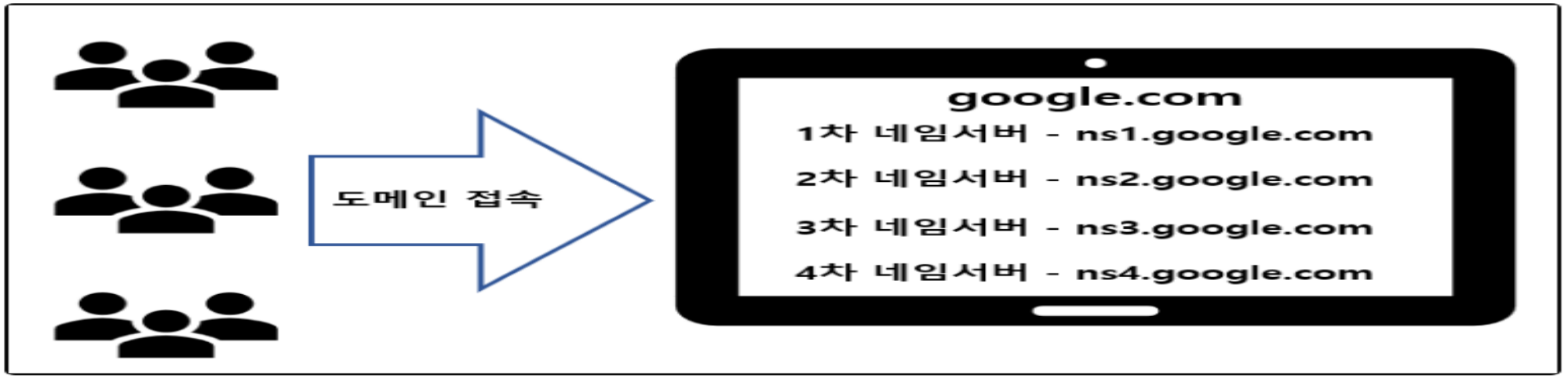
NS 레코드 (Name Server Record)

NS (Name Server)

NS 레코드는 네임 서버 레코드로 도메인에 대한 **네임서버의 권한을 누가 관리하고 있는지** 알려주는 레코드이다.

쉽게 말해, 내가 example.co.kr 이라는 도메인을 **cafe24** 업체에서 구입해서 사용하고 있다고 하면, example.co.kr 도메인을 관리하는 네임 서버는 당연히 cafe24가 되게 된다.

즉 NS 레코드는 어떤 도메인에 대한 처리를 다른 도메인 네임 서버에게 위임하는 기능을 가진 레코드이다.

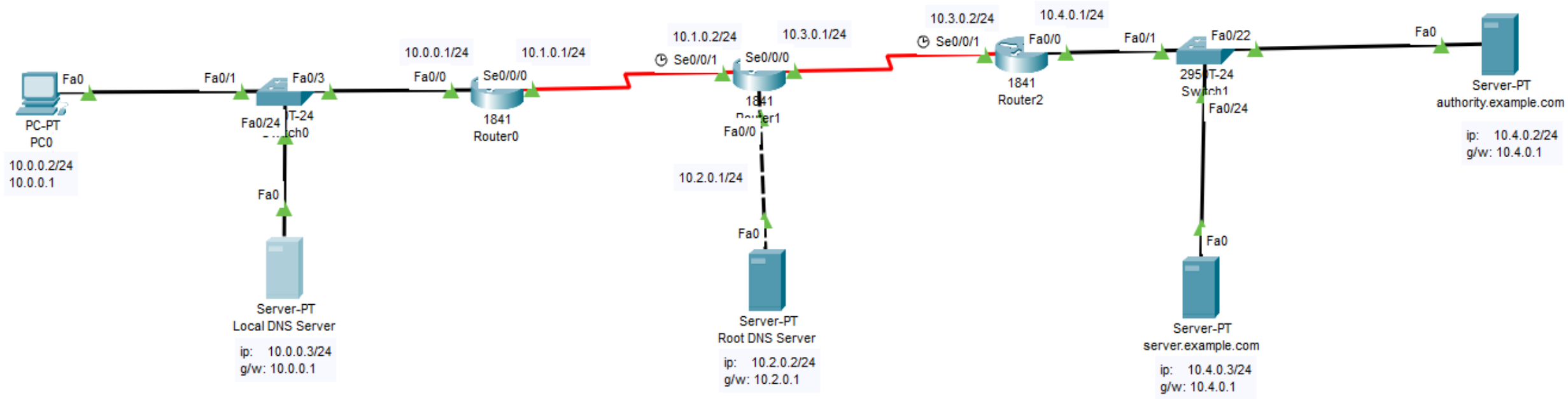


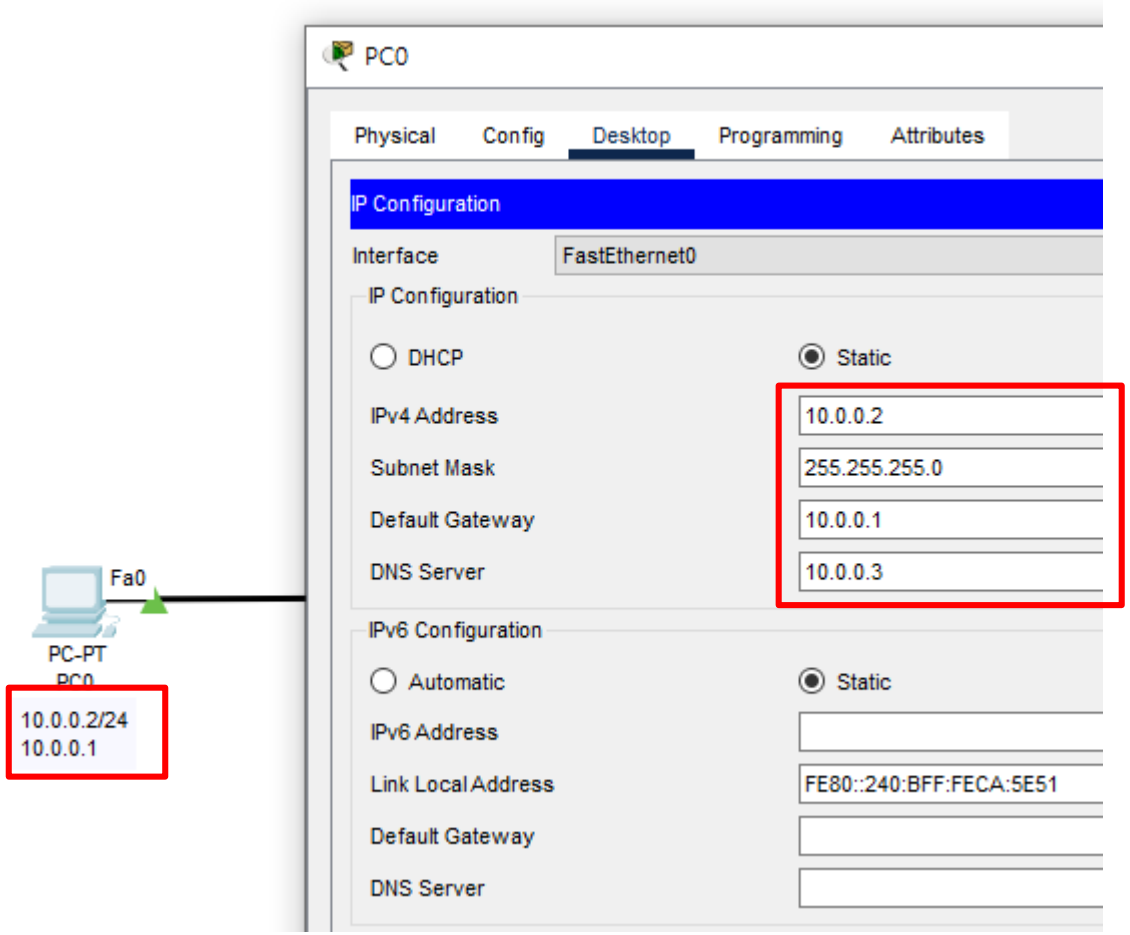
네트워크 용어

SOA 레코드 (Start of Authority Record)

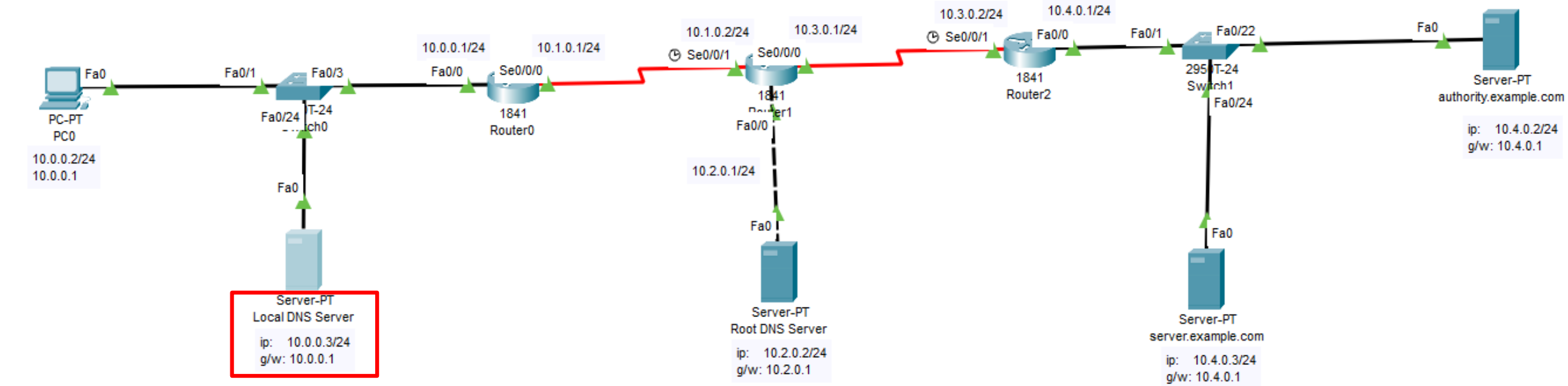
SOA 레코드는 DNS 존의 권한 있는 시작을 나타내며, DNS 존의 기본 정보를 포함합니다. 이 레코드는 해당 DNS 존의 기본 네임 서버, 관리자의 연락처, 존의 시리얼 번호, 데이터 갱신 빈도 등을 제공합니다. SOA 레코드는 DNS 존 전체에 대한 정보를 관리하는 데 사용되며, 존 전송과 슬레이브 서버의 존 파일 갱신 주기를 제어합니다.

DNS


Fa0
PC-PT
PC0
10.0.0.2/24
10.0.0.1
Fa0/1
Fa0/3
Fa0/24
Fa0
Server-PT
Local DNS Server
ip: 10.0.0.3/24
g/w: 10.0.0.1
10.0.0.1/24
Fa0/0
Se0/0/0
1841
Router0
10.1.0.1/24
10.1.0.2/24
Se0/0/1
Se0/0/0
1841
Fa0/0
10.2.0.1/24
Fa0
Server-PT
Root DNS Server
ip: 10.2.0.2/24
g/w: 10.2.0.1
10.3.0.1/24
10.3.0.2/24
Se0/0/1
Fa0/0
1841
Router2
10.4.0.1/24
Fa0/1
Fa0/22
Fa0/24
Fa0
Server-PT
server.example.com
ip: 10.4.0.3/24
g/w: 10.4.0.1
Fa0
Server-PT
authority.example.com
ip: 10.4.0.2/24
g/w: 10.4.0.1


PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.0.0.2
Subnet Mask
255.255.255.0
Default Gateway
10.0.0.1
DNS Server
10.0.0.3
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::240:BFF:FECA:5E51
Default Gateway
DNS Server
Fa0
PC-PT
PC0
10.0.0.2/24
10.0.0.1

PC0의 설정



Local DNS Server
10.0.0.3의
DNS 설정

Local DNS Server

Physical | Config | Services | Desktop | Programming | Attributes

SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP

DNS

DNS Service: On / Off

Resource Records

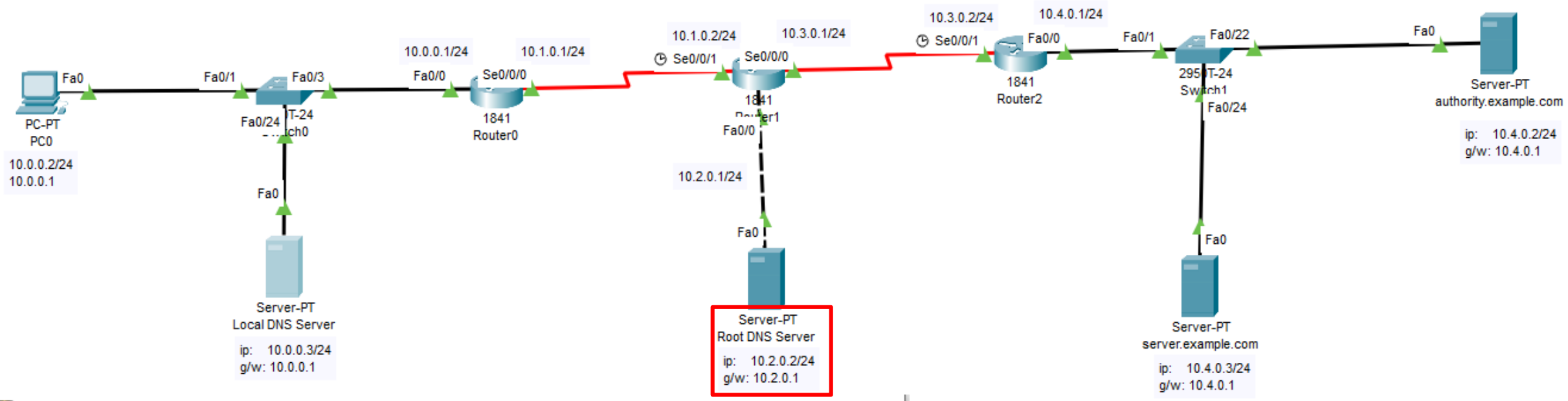
Name: Type: A Record

Address:

Add | Save | Remove

No.	Name	Type	Detail
0	authority	SOA	ServerName:authority MailBox :Authority Expiry :5 Refresh :20 Retry :5 MinTTL :50
1	authority2.example.com	A Record	10.4.0.2
2	com	NS	root
3	dnsserver.com	A Record	10.0.0.3
4	root	A Record	10.2.0.2

DNS Cache



Root DNS Server

Physical | Config | Services | Desktop | Programming | Attributes

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service: On / Off

Resource Records

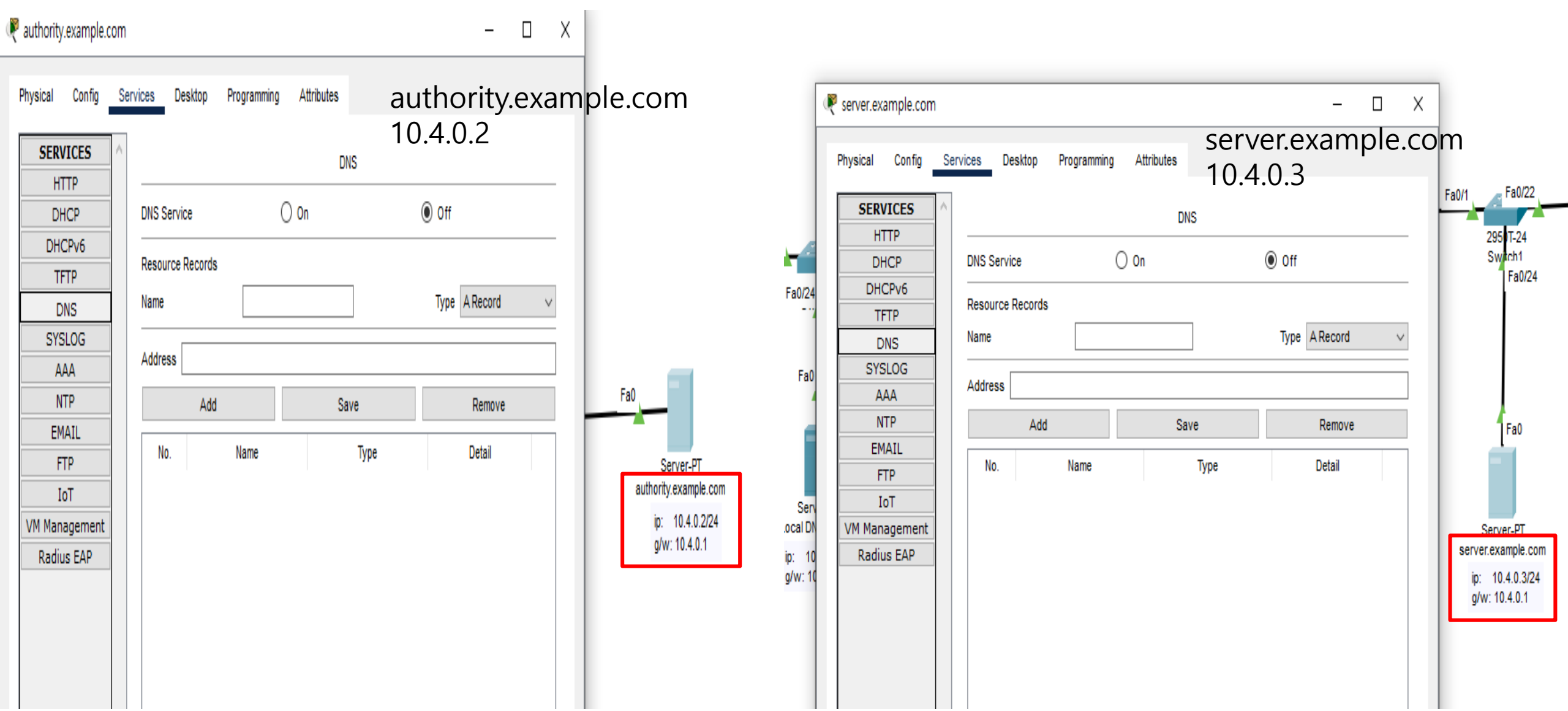
Name: server.example.com Type: A Record

Address: 10.4.0.3

Add | Save | Remove

No.	Name	Type	Detail
0	authority.example.com	A Record	10.4.0.2
1	server.example.com	A Record	10.4.0.3

Root DNS Server
10.2.0.2 의
DNS 설정


authority.example.com
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
Type
A Record
Address
Add
Save
Remove
No.
Name
Type
Detail
authority.example.com
10.4.0.2
server.example.com
10.4.0.3
Fa0
Server-PT
authority.example.com
ip: 10.4.0.2/24
g/w: 10.4.0.1
Fa0/1
Fa0/22
Fa0/24
Switch1
server.example.com
ip: 10.4.0.3/24
g/w: 10.4.0.1

Local DNS Server

Physical | Config | Services | Desktop | Programming | Attributes

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service: On / Off

Resource Records

Name: Type: A Record

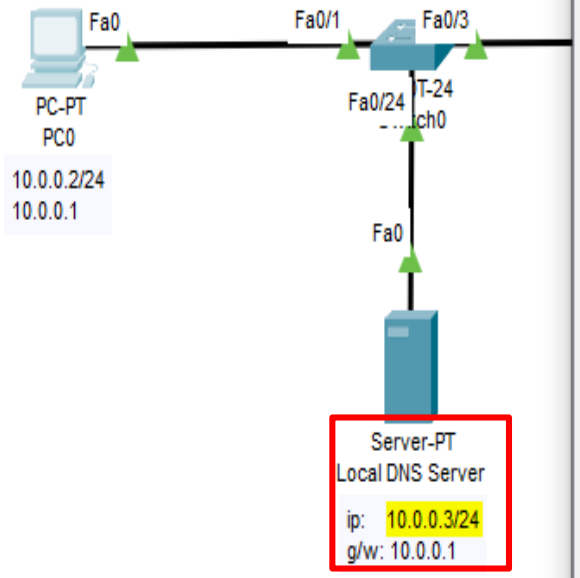
Address:

Add | Save | Remove

No.	Name	Type	Detail
0	authority	SOA	ServerName:authority MailBox :Authority Expiry :5 Refresh :20 Retry :5 MinTTL :50
1	authority2.example.com	A Record	10.4.0.2
2	com	NS	root
3	dnsserver.com	A Record	10.0.0.3
4	root	A Record	10.2.0.2

DNS Cache

PC0에서 ping 확인



PC0

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping dnsserver.com

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=7ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 7ms, Average = 2ms

C:\>
```

Local DNS Server

Physical | Config | Services | Desktop | Programming | Attributes

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service: On / Off

Resource Records

Name: Type: A Record

Address:

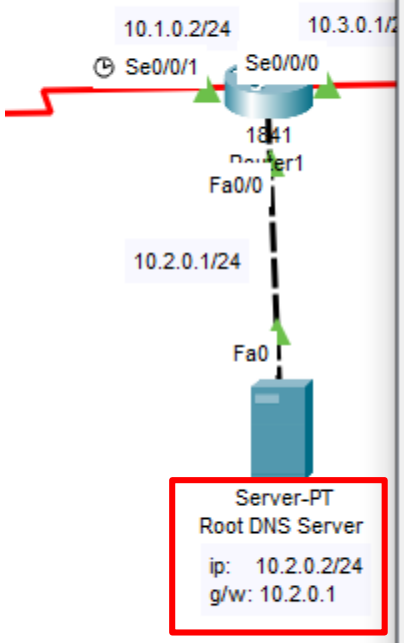
Add | Save | Remove

No.	Name	Type	Detail
0	authority	SOA	ServerName:authority MailBox :Authority Expiry :5 Refresh :20 Retry :5 MinTTL :50
1	authority2.example.com	A Record	10.4.0.2
2	com	NS	root
3	dnsserver.com	A Record	10.0.0.3
4	root	A Record	10.2.0.2

DNS Cache

com 의 관리자는 root

PC0에서 ping 확인



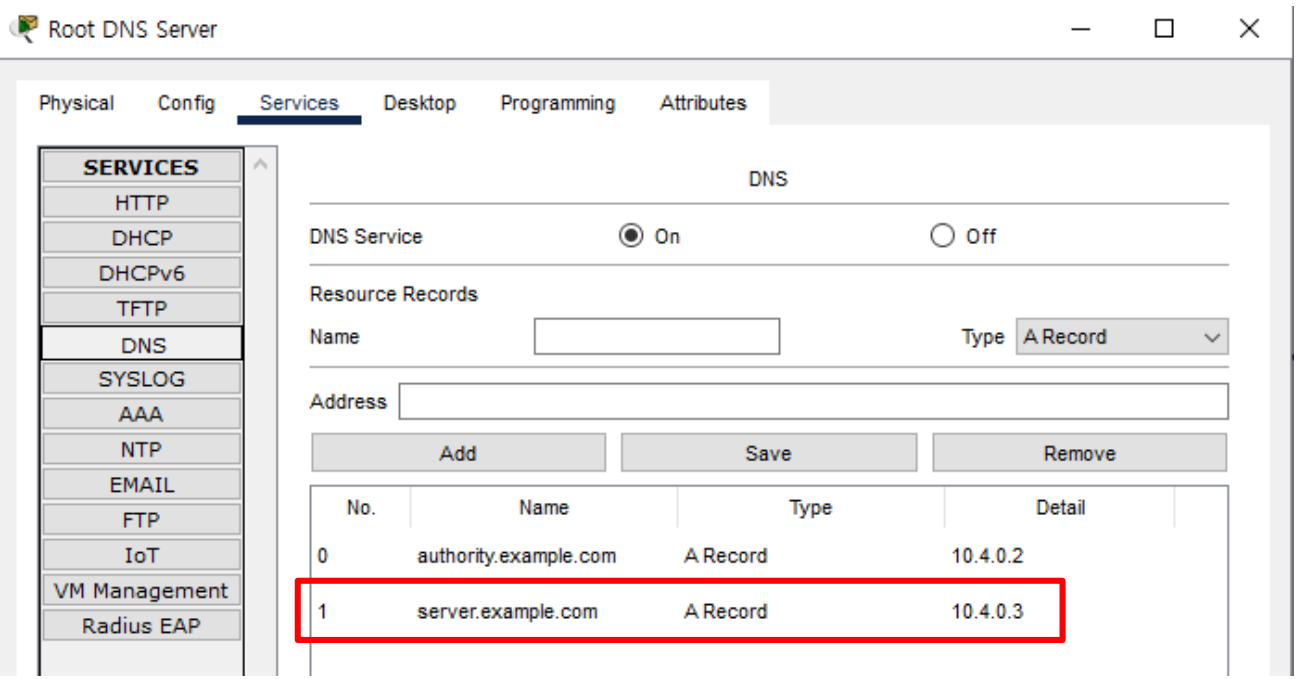
PC0

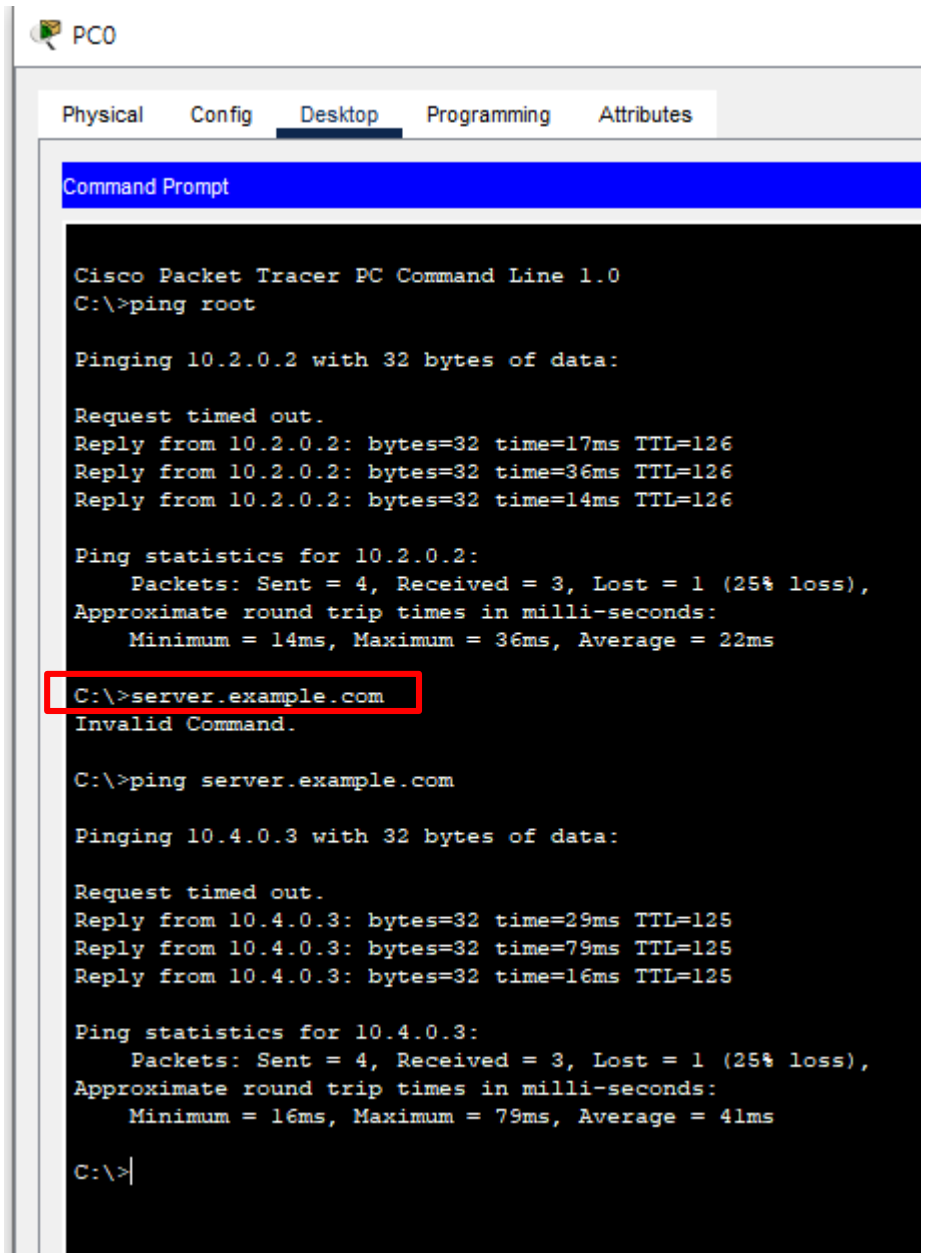
Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping root

Pinging 10.2.0.2 with 32 bytes of data:

Request timed out.
Reply from 10.2.0.2: bytes=32 time=17ms TTL=126
Reply from 10.2.0.2: bytes=32 time=36ms TTL=126
Reply from 10.2.0.2: bytes=32 time=14ms TTL=126

Ping statistics for 10.2.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 14ms, Maximum = 36ms, Average = 22ms

C:\>
```

PC0에서 ping 확인





Root DNS Server

Physical | Config | Services | Desktop | Programming | Attributes

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service: (•) On ( ) Off

Resource Records

Name: _____ Type: A Record

Address: _____

Add | Save | Remove

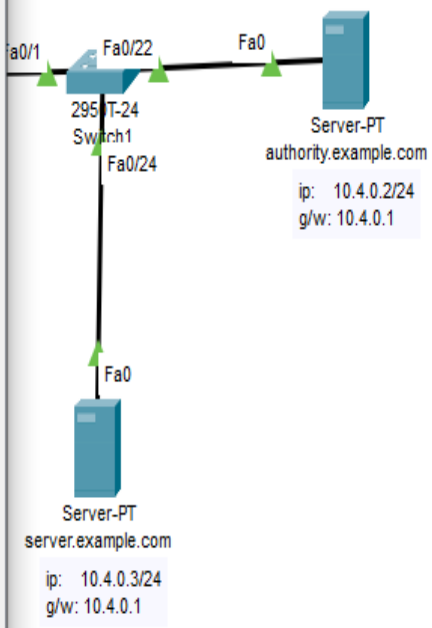
No.	Name	Type	Detail
0	authority.example.com	A Record	10.4.0.2
1	server.example.com	A Record	10.4.0.3

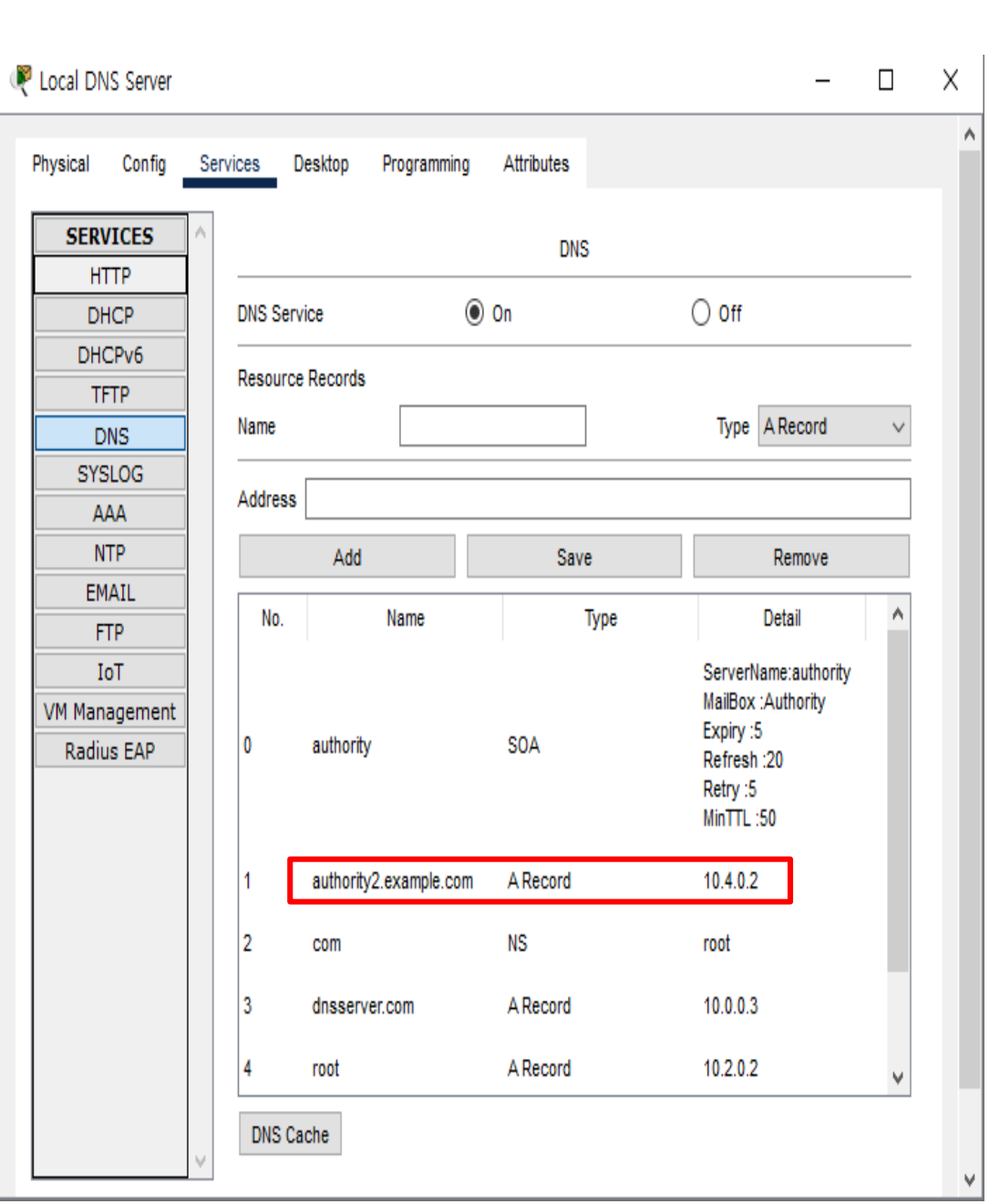
PC0

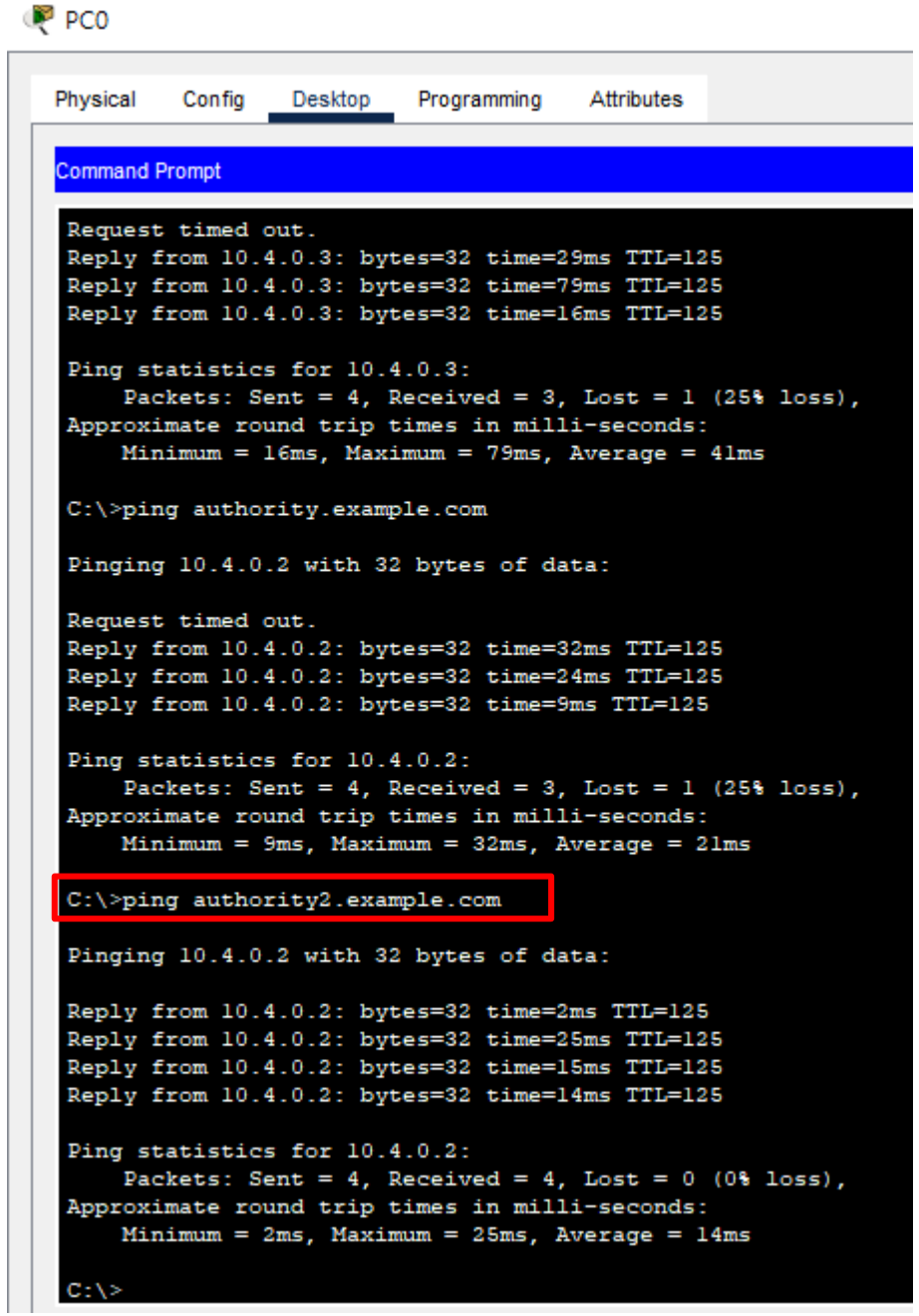
Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Reply from 10.2.0.2: bytes=32 time=14ms TTL=126

Ping statistics for 10.2.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 14ms, Maximum = 36ms, Average = 22ms

C:\>server.example.com
Invalid Command.

C:\>ping server.example.com

Pinging 10.4.0.3 with 32 bytes of data:

Request timed out.
Reply from 10.4.0.3: bytes=32 time=29ms TTL=125
Reply from 10.4.0.3: bytes=32 time=79ms TTL=125
Reply from 10.4.0.3: bytes=32 time=16ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 16ms, Maximum = 79ms, Average = 41ms

C:\>ping authority.example.com

Pinging 10.4.0.2 with 32 bytes of data:

Request timed out.
Reply from 10.4.0.2: bytes=32 time=32ms TTL=125
Reply from 10.4.0.2: bytes=32 time=24ms TTL=125
Reply from 10.4.0.2: bytes=32 time=9ms TTL=125

Ping statistics for 10.4.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 32ms, Average = 21ms

C:\>
```




Local DNS Server
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
Type
A Record
Address
Add
Save
Remove
No.
Name
Type
Detail
0
authority
SOA
ServerName:authority
MailBox :Authority
Expiry :5
Refresh :20
Retry :5
MinTTL :50
1
authority2.example.com
A Record
10.4.0.2
2
com
NS
root
3
dnsserver.com
A Record
10.0.0.3
4
root
A Record
10.2.0.2
DNS Cache


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Request timed out.
Reply from 10.4.0.3: bytes=32 time=29ms TTL=125
Reply from 10.4.0.3: bytes=32 time=79ms TTL=125
Reply from 10.4.0.3: bytes=32 time=16ms TTL=125
Ping statistics for 10.4.0.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 16ms, Maximum = 79ms, Average = 41ms
C:\>ping authority.example.com
Pinging 10.4.0.2 with 32 bytes of data:
Request timed out.
Reply from 10.4.0.2: bytes=32 time=32ms TTL=125
Reply from 10.4.0.2: bytes=32 time=24ms TTL=125
Reply from 10.4.0.2: bytes=32 time=9ms TTL=125
Ping statistics for 10.4.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 9ms, Maximum = 32ms, Average = 21ms
C:\>ping authority2.example.com
Pinging 10.4.0.2 with 32 bytes of data:
Reply from 10.4.0.2: bytes=32 time=2ms TTL=125
Reply from 10.4.0.2: bytes=32 time=25ms TTL=125
Reply from 10.4.0.2: bytes=32 time=15ms TTL=125
Reply from 10.4.0.2: bytes=32 time=14ms TTL=125
Ping statistics for 10.4.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 25ms, Average = 14ms
C:\>