



گزارش کار آزمایشگاه یازدهم شبکه

دانشگاه مهندسی کامپیوتر

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نام و نام خانوادگی	کیمیا منتظری	شماره دانشجویی	نام و شماره آزمایش	RIP-v2 پروتکل و OSPF	۱۱) آشنایی با
		۹۹۳۱۰۷۸			
هدف آزمایش	•	آشنایی با پروتکل RIP نسخه ۲	•		
ابزارهای مورد نیاز	•	آشنایی با پروتکل OSPF	•		
شرح آزمایش	•	کامپیوتر شخصی	•	شبیه‌ساز Cisco Packet Tracer نسخه ۶.۲	ابتدا توپولوژی زیر را کشیده و آدرس‌های IP مشخص شده برای هر host و interface را تنظیم می‌کنیم.
					حال، اگر از هر host تا لبه شبکه ping reply دریافت می‌کنیم اما از این محدوده به بعد timeout خواهد شد و ارتباط برقرار نخواهد بود، که در شکل‌های زیر قابل مشاهده است:

PC2

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 172.17.0.1
Pinging 172.17.0.1 with 32 bytes of data:
Reply from 172.17.0.1: bytes=32 time<1ms TTL=255
Reply from 172.17.0.1: bytes=32 time<1ms TTL=255
Reply from 172.17.0.1: bytes=32 time<1ms TTL=255
Reply from 172.17.0.1: bytes=32 time=<1ms TTL=255

Ping statistics for 172.17.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.0.2
Pinging 172.17.0.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.17.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

Top

PCO

Physical Config Desktop Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.18.0.1
Pinging 172.18.0.1 with 32 bytes of data:
Reply from 172.18.0.1: bytes=32 time<1ms TTL=255
Reply from 172.18.0.1: bytes=32 time<1ms TTL=255
Reply from 172.18.0.1: bytes=32 time<1ms TTL=255
Reply from 172.18.0.1: bytes=32 time=<1ms TTL=255

Ping statistics for 172.18.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.0.2
Pinging 172.17.0.2 with 32 bytes of data:
Reply from 172.17.0.2: bytes=32 time<1ms TTL=255
Reply from 172.17.0.2: bytes=32 time<1ms TTL=255
Reply from 172.17.0.2: bytes=32 time<1ms TTL=255
Reply from 172.17.0.2: bytes=32 time=<1ms TTL=255

Ping statistics for 172.17.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Top

PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
Pinging 172.17.0.2 with 32 bytes of data:
Reply from 172.17.0.2: bytes=32 time<1ms TTL=255

Ping statistics for 172.17.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.19.0.1

Pinging 172.19.0.1 with 32 bytes of data:
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255
Reply from 172.19.0.1: bytes=32 time=1ms TTL=255
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.19.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 172.19.0.1

Pinging 172.19.0.1 with 32 bytes of data:
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255
Reply from 172.19.0.1: bytes=32 time=1ms TTL=255
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255
Reply from 172.19.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.19.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.17.0.1

Pinging 172.17.0.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.17.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 172.19.0.2
Pinging 172.19.0.2 with 32 bytes of data:
Reply from 172.19.0.2: bytes=32 time<1ms TTL=255
Reply from 172.19.0.2: bytes=32 time=1ms TTL=255
Reply from 172.19.0.2: bytes=32 time<1ms TTL=255
Reply from 172.19.0.2: bytes=32 time<1ms TTL=255

Ping statistics for 172.19.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.19.0.1
Pinging 172.19.0.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.19.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

RIP-v2: استفاده از یروتکل Dynamic Routing

برای این کار ابتدا دستورات زیر را در هر مسیریاب وارد می‌کنیم:

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#rou
Router(config)#router r
Router(config)#router rip
Router(config-router)#v
Router(config-router)#ver
Router(config-router)#version 2
Router(config-router)#netw
Router(config-router)#+
Router(config-router)#+
Router(config-router)#+network 172.17.0.0
Router(config-router)#+network 172.16.0.0
Router(config-router)#+

Command+F6 to exit CLI focus

Top

Copy Paste

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router r
Router(config)#router rip
Router(config-router)#ver
Router(config-router)#version 2
Router(config-router)#
Router(config-router)#
Router(config-router)#
Router(config-router)#network 172.17.0.0
Router(config-router)#network 172.18.0.0
Router(config-router)#network 172.19.0.0
Router(config-router)#[

Command+F6 to exit CLI focus

Copy Paste

Top

```
Router>
Router>ena
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#ver
Router(config-router)#version 2
Router(config-router)#network 172.19.0.0
Router(config-router)#network 172.20.0.0
Router(config-router)#
Command+F6 to exit CLI focus
```

Top

در این صورت ارتباط میان تمام hostها به درستی برقرار خواهد شد و یکدیگر را می‌توانند ping کنند. برای مثال ping یکی از interface‌های router که قبلاً timeout شده بود، این بار مشاهده می‌شود که reply گرفته است:

PC1

Physical Config Desktop Programming Attributes

Command Prompt X

```
C:\>ping 172.19.0.1

Pinging 172.19.0.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.19.0.1:
  Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 172.19.0.1

Pinging 172.19.0.1 with 32 bytes of data:

Reply from 172.19.0.1: bytes=32 time<1ms TTL=254
Reply from 172.19.0.1: bytes=32 time<1ms TTL=254
Reply from 172.19.0.1: bytes=32 time=1ms TTL=254
Reply from 172.19.0.1: bytes=32 time<1ms TTL=254

Ping statistics for 172.19.0.1:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Top

و اگر از همین PC0 را بگیرید:

PC1

Physical Config Desktop Programming Attributes

Command Prompt X

```
Pinging 172.18.0.1 with 32 bytes of data:  
Reply from 172.18.0.1: bytes=32 time<1ms TTL=254  
  
Ping statistics for 172.18.0.1:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
C:\>ping 172.18.0.10  
  
Pinging 172.18.0.10 with 32 bytes of data:  
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126  
Reply from 172.18.0.10: bytes=32 time=1ms TTL=126  
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126  
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126  
  
Ping statistics for 172.18.0.10:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 1ms, Average = 0ms  
  
C:\>
```

Top

و اگر ping ا را PC2 بگیریم:

```
PC1
Physical Config Desktop Programming Attributes
Command Prompt X
Pinging 172.18.0.10 with 32 bytes of data:
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126
Reply from 172.18.0.10: bytes=32 time=1ms TTL=126
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126

Ping statistics for 172.18.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.16.0.10

Pinging 172.16.0.10 with 32 bytes of data:
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125
Reply from 172.16.0.10: bytes=32 time=1ms TTL=125

Ping statistics for 172.16.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

OSPF: استفاده از پروتکل Dynamic Routing
یک کپی از توپولوژی که در اول کار داشتیم گرفته و دستورات زیر را در هر مسیریاب وارد می‌کنیم (در این توپولوژی تنها یک area داریم):

Router2(1)

Physical Config **CLI** Attributes

IOS Command Line Interface

```
DRAM configuration is 64 bits wide with parity disabled.  
255K bytes of non-volatile configuration memory.  
249856K bytes of ATA System CompactFlash 0 (Read/Write)  
  
Press RETURN to get started!  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,  
changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,  
changed state to up  
  
Router>enable  
Router#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router os  
Router(config)#router ospf 1  
Router(config-router)#network 172.16.0.0 0.0.0.255 area 1  
Router(config-router)#network 172.17.0.0 0.0.0.255 area 1  
Router(config-router)#  
00:27:18: %OSPF-5-ADJCHG: Process 1, Nbr 172.19.0.1 on  
GigabitEthernet0/0 from LOADING to FULL, Loading Done
```

Command+F6 to exit CLI focus

Top

Router4(1)

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

Router>enable
Router#cong f t
^
% Invalid input detected at '^' marker.

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router os
Router(config)#router ospf 1
Router(config-router)#network 172.17.0.0 0.0.0.255 area 1
Router(config-router)#network 172.18.0.0 0.0.0.255 area 1
Router(config-router)#network 172.19.0.0 0.0.0.255 area 1
Router(config-router)#
00:27:18: %OSPF-5-ADJCHG: Process 1, Nbr 172.17.0.1 on
GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#
00:28:33: %OSPF-5-ADJCHG: Process 1, Nbr 172.20.0.1 on
GigabitEthernet0/2 from LOADING to FULL, Loading Done
```

Command+F6 to exit CLI focus

Top

Copy Paste

The screenshot shows a Mac OS X window titled "Router5(1)" with the "CLI" tab selected. The window displays the IOS Command Line Interface. The text area contains the following output:

```
249856K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router os
Router(config)#router ospf
% Incomplete command.
Router(config)#router ospf 1
Router(config-router)#network 172.19.0.0 0.0.0.255 area 1
Router(config-router)#network 172.20.0.0 0.0.0.255 area 1
Router(config-router)#
00:28:33: %OSPF-5-ADJCHG: Process 1, Nbr 172.19.0.1 on
GigabitEthernet0/0 from LOADING to FULL, Loading Done
```

At the bottom of the window, there are buttons for "Copy" and "Paste". Below the window, there is a small checkbox labeled "Top".

حال، ارتباط میان تمام شبکه‌ها برقرار بوده و hostها قادر به ارسال و دریافت پسته از خارج شبکه هستند. برای مثال اگر از طریق PC0، PC1 ping کنیم، reply برگردانده می‌شود:

PC1(1)

Physical Config Desktop Programming Attributes

Command Prompt X

```
Pinging 172.19.0.1 with 32 bytes of data:  
Request timed out.  
Reply from 172.19.0.1: bytes=32 time<1ms TTL=254  
Reply from 172.19.0.1: bytes=32 time<1ms TTL=254  
Reply from 172.19.0.1: bytes=32 time<1ms TTL=254  
  
Ping statistics for 172.19.0.1:  
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 0ms, Average = 0ms  
  
C:\>ping 172.18.0.10  
  
Pinging 172.18.0.10 with 32 bytes of data:  
Request timed out.  
Reply from 172.18.0.10: bytes=32 time=2ms TTL=126  
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126  
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126  
  
Ping statistics for 172.18.0.10:  
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 0ms, Maximum = 2ms, Average = 0ms  
  
C:\>
```

و همینطور PC2:

PC1(1)

Physical Config Desktop Programming Attributes

Command Prompt X

```
Pinging 172.18.0.10 with 32 bytes of data:
Request timed out.
Reply from 172.18.0.10: bytes=32 time=2ms TTL=126
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126
Reply from 172.18.0.10: bytes=32 time<1ms TTL=126

Ping statistics for 172.18.0.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 172.16.0.10

Pinging 172.16.0.10 with 32 bytes of data:
Reply from 172.16.0.10: bytes=32 time=1ms TTL=125
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125
Reply from 172.16.0.10: bytes=32 time<1ms TTL=125

Ping statistics for 172.16.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Top

به طور کلی، در این آزمایش با موارد زیر آشنا شدیم:

- dynamic routing
- نحوه کانفیگ کردن پروتکل RIP-v2 در مسیریابها و دستورات لازم برای آن
- نحوه کانفیگ کردن پروتکل OSPF در مسیریابها، تعریف areaها، و دستورات لازم برای آن

نتیجه‌گیری