【MVS】思科路由器 IPV6 6 to 4典型组网配置案例
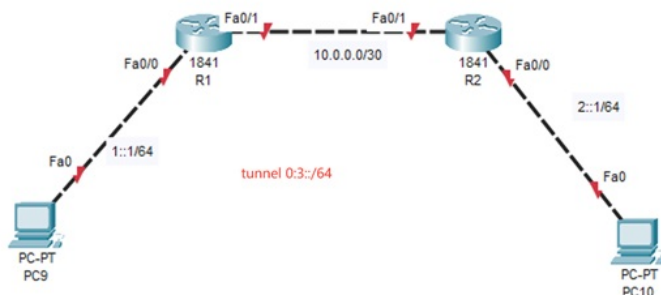
网络相关   韦家宁   2024-07-03 发表

组网及说明

组网说明：

本案例采用思科模拟器的路由器来部署IPV6 6 to 4的环境，在该网络中，IPV6的网络需要穿越IPV4的网络，因此要使用6 to 4的解决方案来满足需求。

配置步骤

配置思路：

1、按照网络拓扑图配置IPV4地址、IPV6地址。

2、按照网络拓扑图配置 6 to 4

配置关键点

（1）基础网络配置。

Router>ena

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#hos R1

R1(config)#int f 0/0

R1(config-if)#ipv6 enable

R1(config-if)#ipv6 address 1::1/64

R1(config-if)#no shutdown

R1(config-if)#exit

R1(config)#int f 0/1

R1(config-if)#ip address 10.0.0.1 255.255.255.252

R1(config-if)#no shutdown

R1(config-if)#exit

R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.2

R1(config)#ipv6 u

R1(config)#ipv6 unicast-routing

R1(config)#do wr

Building configuration...

[OK]

R1(config)#

R2：

Router>ena

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#hos R2

R2(config)#int f 0/0

R2(config-if)#ipv6 enable

R2(config-if)#ipv6 address 2::1/64

R2(config-if)#no shutdown

R2(config-if)#exit

R2(config)#int f 0/1

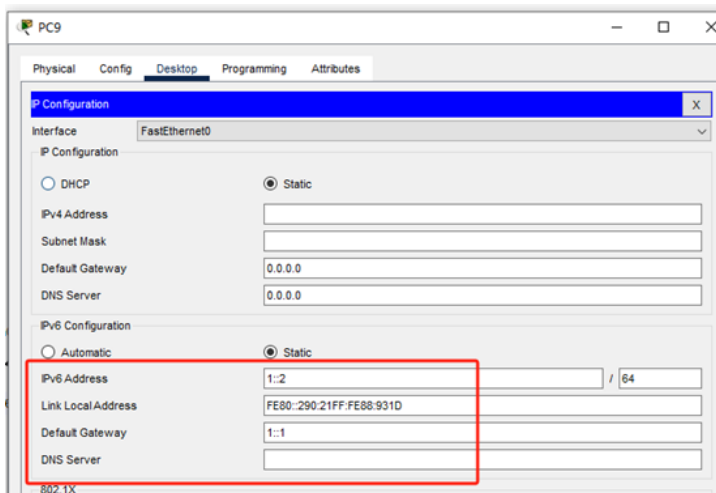R2(config-if)#ip address 10.0.0.2 255.255.255.252

R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.1
R2(config)#ipv6 u
R2(config)#ipv6 unicast-routing
R2(config)#do wr
Building configuration...
[OK]
R2(config)#

 (2) 配置 6 to 4
R1：
R1(config)#int tunnel 0
R1(config-if)#ipv6 enable
R1(config-if)#ipv6 address 3::1/64
R1(config-if)#tunnel source f 0/1
R1(config-if)#tunnel destination 10.0.0.2
R1(config-if)#tunnel mode ipv6ip
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#ipv6 route ::/0 3::2
R1(config)#do wr
Building configuration...
[OK]

R2：
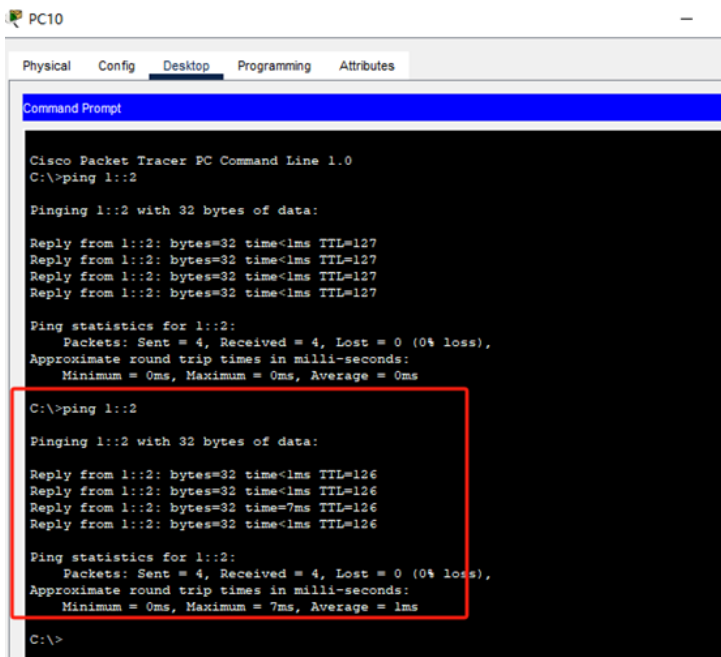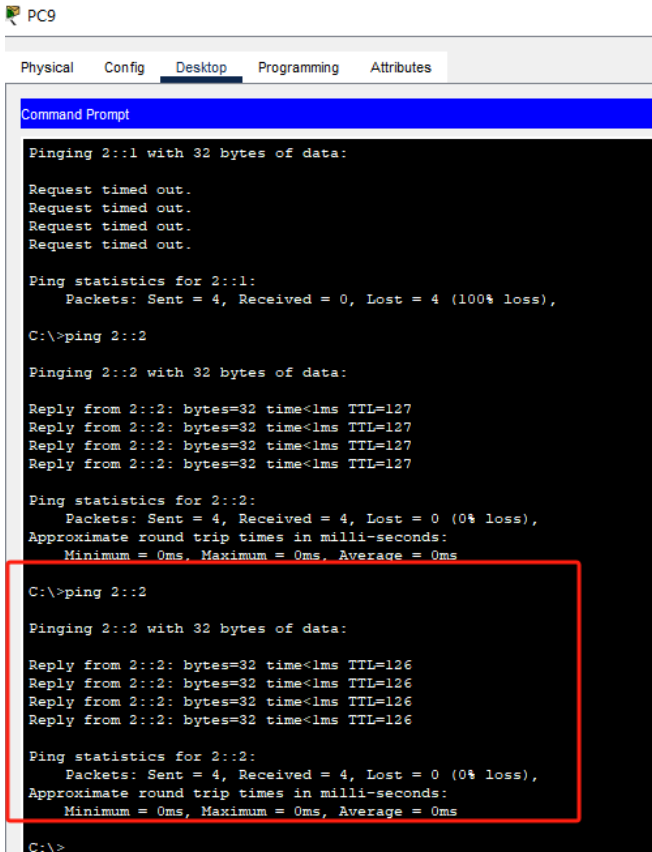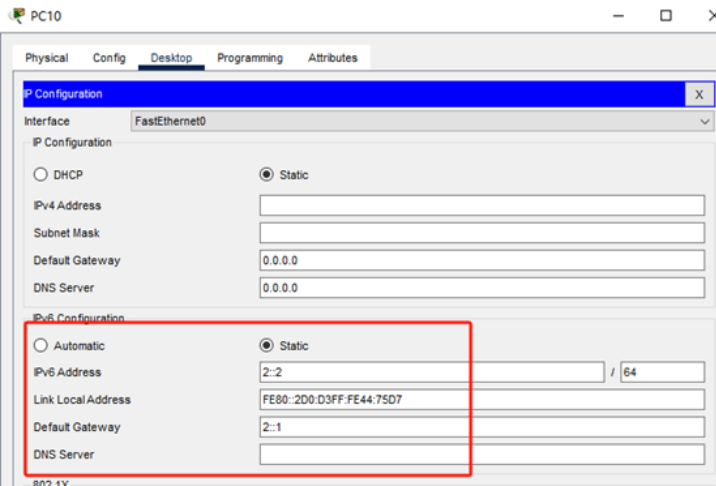R2(config)#int tunnel 0
R2(config-if)#ipv6 enable
R2(config-if)#ipv6 address 3::2/64
R2(config-if)#tunnel source f 0/1
R2(config-if)#tunnel destination 10.0.0.1
R2(config-if)#tunnel mode ipv6ip
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#ipv6 route ::/0 3::1
R2(config)#do wr
Building configuration...
[OK]
R2(config)#

PC分别填写IPV6地址，且能相互PING通。

PC10

Physical Config Desktop Programming Attributes

IP Configuration   X

Interface   FastEthernet0

IP Configuration
○ DHCP   ● Static

IPv4 Address
Subnet Mask
Default Gateway   0.0.0.0
DNS Server   0.0.0.0

IPv6 Configuration
○ Automatic   ● Static
IPv6 Address   2::2   / 64
Link Local Address FE80::2D0:D3FF:FE44:75D7
Default Gateway   2::1
DNS Server

PC9

Physical Config Desktop Programming Attributes

Command Prompt

```
Pinging 2::1 with 32 bytes of data:

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

Ping statistics for 2::1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 2::2

Pinging 2::2 with 32 bytes of data:

Reply from 2::2: bytes=32 time<1ms TTL=127
Reply from 2::2: bytes=32 time<1ms TTL=127
Reply from 2::2: bytes=32 time<1ms TTL=127
Reply from 2::2: bytes=32 time<1ms TTL=127

Ping statistics for 2::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 2::2

Pinging 2::2 with 32 bytes of data:

Reply from 2::2: bytes=32 time<1ms TTL=126
Reply from 2::2: bytes=32 time<1ms TTL=126
Reply from 2::2: bytes=32 time<1ms TTL=126
Reply from 2::2: bytes=32 time<1ms TTL=126

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

C:\>
```


PC10

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 1::2

Pinging 1::2 with 32 bytes of data:

Reply from 1::2: bytes=32 time<1ms TTL=127
Reply from 1::2: bytes=32 time<1ms TTL=127
Reply from 1::2: bytes=32 time<1ms TTL=127
Reply from 1::2: bytes=32 time<1ms TTL=127

Ping statistics for 1::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 1::2

Pinging 1::2 with 32 bytes of data:

Reply from 1::2: bytes=32 time<1ms TTL=126
Reply from 1::2: bytes=32 time<1ms TTL=126
Reply from 1::2: bytes=32 time=7ms TTL=126
Reply from 1::2: bytes=32 time<1ms TTL=126

Ping statistics for 1::2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 7ms, Average = 1ms

C:\>
```

分别查看R1、R2的IPV6路由表，发现IPV6静态路由已经写入到路由表中。

```
R1(config)#do sh ipv6 ro
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
S   ::/0 [1/0]
     via 3::2
C   1::/64 [0/0]
     via ::, FastEthernet0/0
L   1::1/128 [0/0]
     via ::, FastEthernet0/0
C   3::/64 [0/0]
     via ::, Tunnel0
L   3::1/128 [0/0]
     via ::, Tunnel0
L   FF00::/8 [0/0]
     via ::, Null0
R1(config)#
```

```
R2(config)#do sh ipv6 ro
IPv6 Routing Table - 6 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
S   ::/0 [1/0]
     via 3::1
C   2::/64 [0/0]
     via ::, FastEthernet0/0
L   2::1/128 [0/0]
     via ::, FastEthernet0/0
C   3::/64 [0/0]
     via ::, Tunnel0
L   3::2/128 [0/0]
     via ::, Tunnel0
L   FF00::/8 [0/0]
     via ::, Null0
R2(config)#
```

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至此，思科路由器6 to 4典型组网配置案例已完成。