lab3实验报告

姓名:　柯志伟

学号: PB20061338

1　实验目的

- 掌握子网的划分和网络拓扑的构建
- 掌握静态路由、RIP和OSPF的配置

2　实验环境与器材

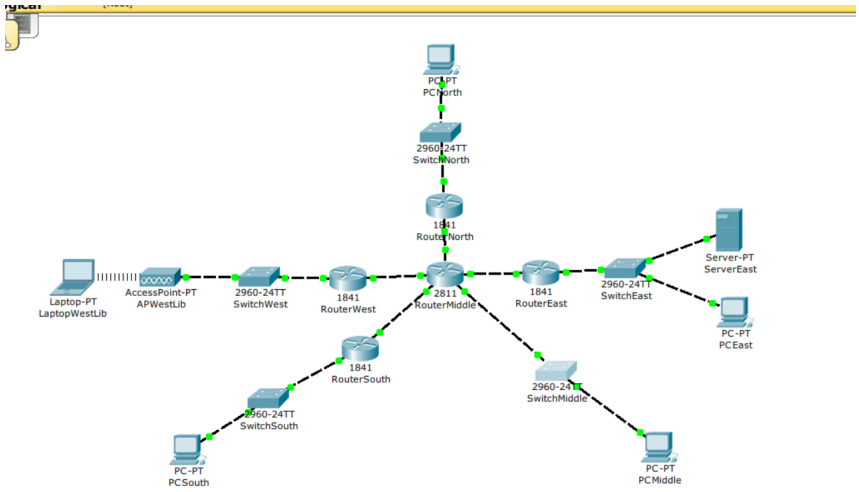
- 环境
  模拟软件Cisco Packet Tracer 5.2
  Windows
- 器材
  Cisco 2811路由器1台
  1841路由器4台
  2960-24TT交换机4台
  Access Point-PT 1台
  笔记本电脑1台，服务器1台， PC机3台
  Copper Cross-Over（铜芯双绞线）若干

3　实验要求

- 搭建场景：五个校区的网络及校区之间的互连

4　实验过程

4.1　构建网络拓扑



4.2 选定待分配的网段

- 学号为PB20061338,选择网段为13.38.0.0/20

4.3 子网划分方案

Campus		Subnet
北区		13.38.0.0/24
东区		13.38.1.0/24
南区		13.38.2.0/24
西区		13.38.3.0/24
中区	中区-北区路由	13.38.4.0/24
	中区-东区路由	13.38.5.0/24
	中区-南区路由	13.38.6.0/24
	中区-西区路由	13.38.7.0/24
	中区路由	13.38.8.0/24

4.4 路由器接口连接及IP地址分配

Device	Interface	IP Address	Mask	To Device	To Interface
RouterMiddle,Cisic 2811,NM-2FE2W,WIC-1ENET	FastEthernet0/0	13.38.4.1		RouterNorth	FastEthernet0/0
	FastEthernet0/1	13.38.5.1		RouterEast	FastEthernet0/0
	FastEthernet1/0	13.38.6.1		RouterSouth	FastEthernet0/0
	FastEthernet1/1	13.38.7.1		RouterWest	FastEthernet0/0
	Ethernet0/1/0	13.38.8.1		SwitchMiddle	
RouterNorth,Cisic 1841	FastEthernet0/0	13.38.4.2		RouterMiddle	FastEthernet0/0
	FastEthernet0/1	13.38.0.1	255.255.255.0	SwitchNorth	
RouterEast,Cisic 1841	FastEthernet0/0	13.38.5.2		RouterMiddle	FastEthernet0/1
	FastEthernet0/1	13.38.1.1		SwitchEast	
RouterSouth,Cisic 1841	FastEthernet0/0	13.38.6.2		RouterMiddle	FastEthernet1/0
	FastEthernet0/1	13.38.2.1		SwitchSouth	
RouterSouth,Cisic 1841	FastEthernet0/0	13.38.7.2		RouterMiddle	FastEthernet1/1
	FastEthernet0/1	13.38.3.1		SwitchWest	

4.5 终端设备接口连接及IP地址

Device	IP address	Mask	Gateway
PCNorth	13.38.0.2	255.255.255.0	13.38.0.1
ServerEast	13.38.1.2		13.38.1.1
PCEast	13.38.1.3		13.38.1.1
PCSouth	13.38.2.2		13.38.2.1
LaptopWestLib,Linksys-WPC300N	13.38.3.2		13.38.3.1
PCMiddle	13.38.8.2		13.38.8.1

4.6 配置静态路由

路由表

Router	Network	Mask	Next Hop
RouterMiddle	13.38.0.0	255.255.255.0	13.38.4.2
	13.38.1.0		13.38.5.2
	13.38.2.0		13.38.6.2
	13.38.3.0		13.38.7.2

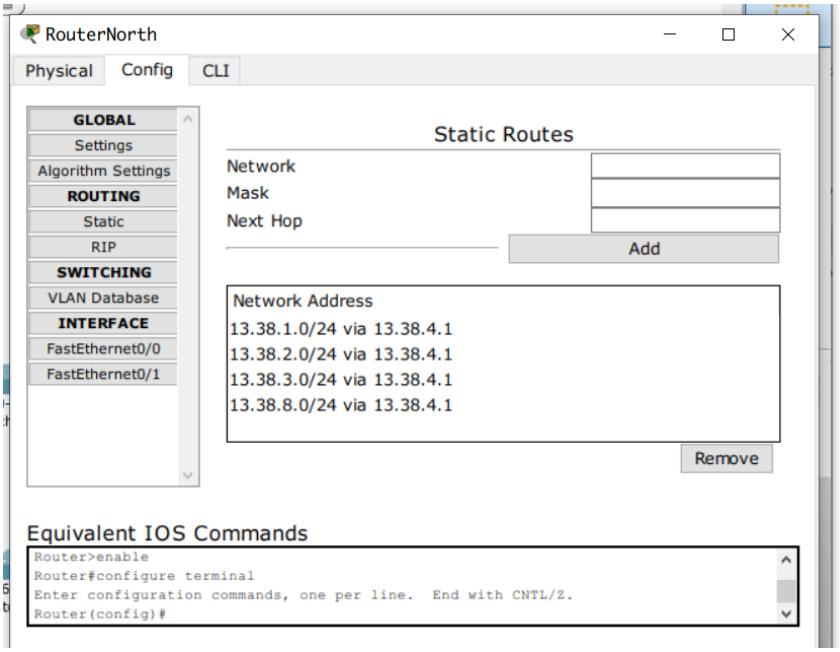
Router	Network	Mask	Next Hop
RouterNorth	13.38.1.0	255.255.255.0	13.38.4.1
	13.38.2.0		
	13.38.3.0		
	13.38.8.0		

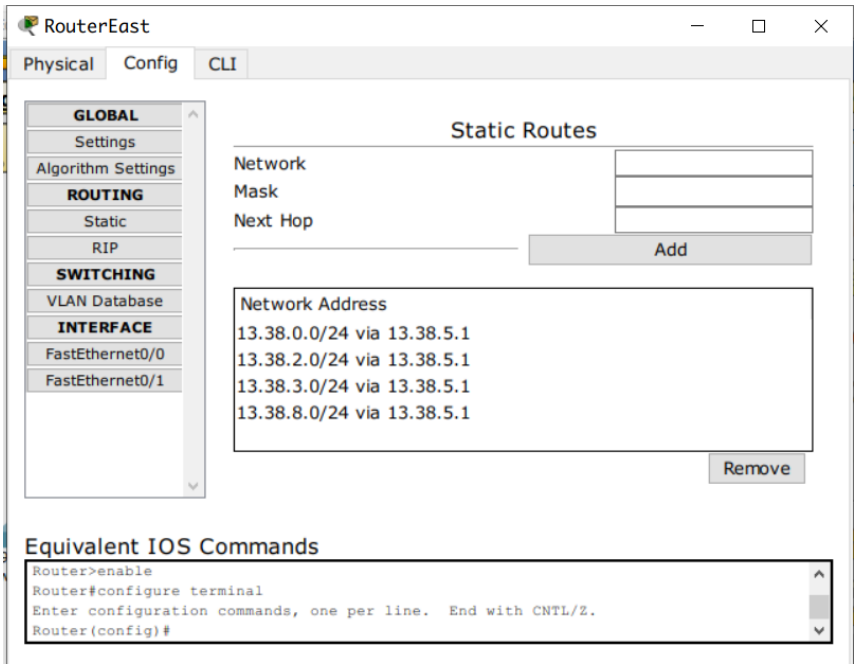
Router	Network	Mask	Next Hop
RouterEast	13.38.0.0 13.38.2.0 13.38.3.0 13.38.8.0	255.255.255.0	13.38.5.1

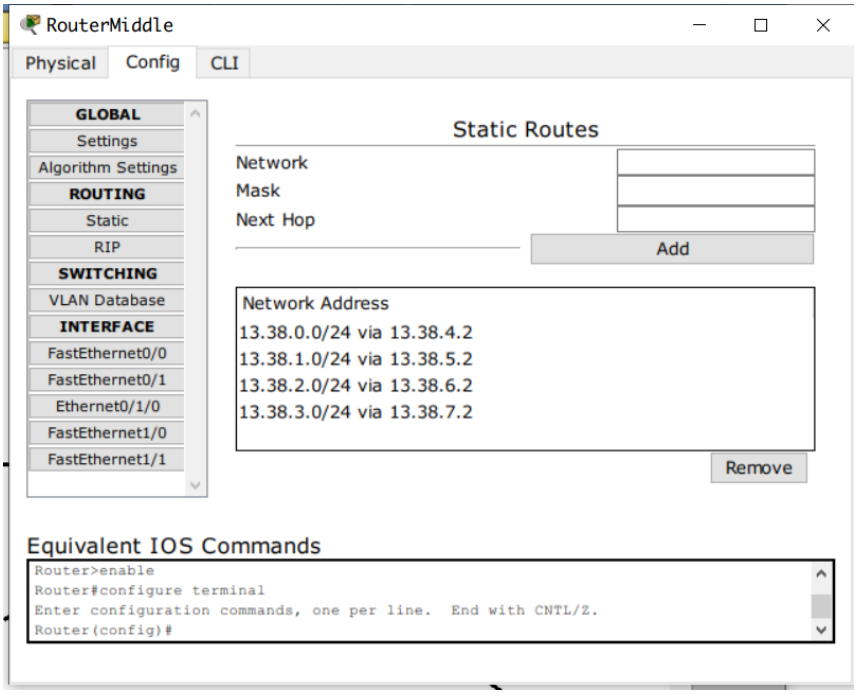
Router	Network	Mask	Next Hop
RouterSouth	13.38.0.0 13.38.1.0 13.38.3.0 13.38.8.0	255.255.255.0	13.38.6.1

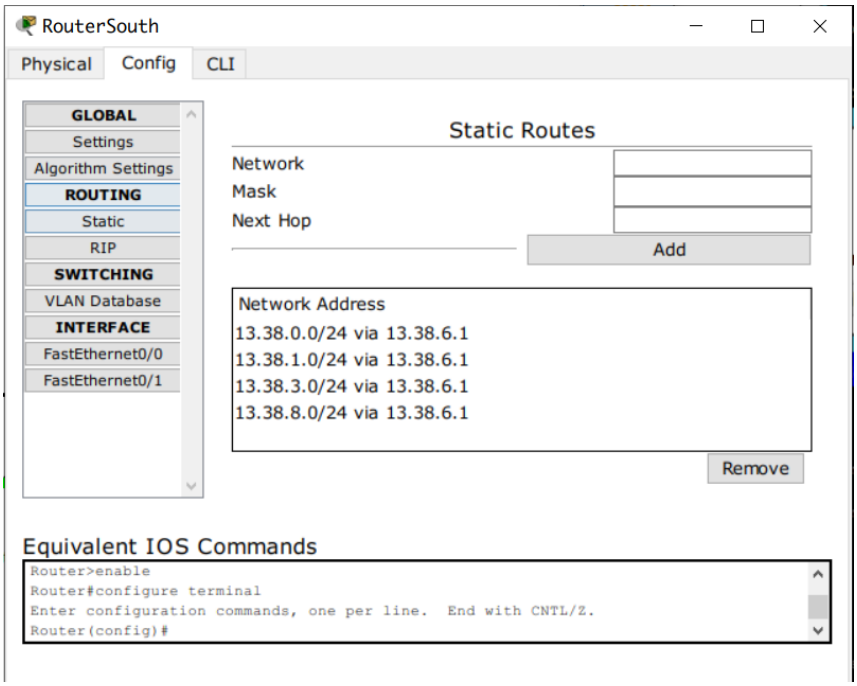
Router	Network	Mask	Next Hop
RouterWest	13.38.0.0 13.38.1.0 13.38.2.0 13.38.8.0	255.255.255.0	13.38.7.1

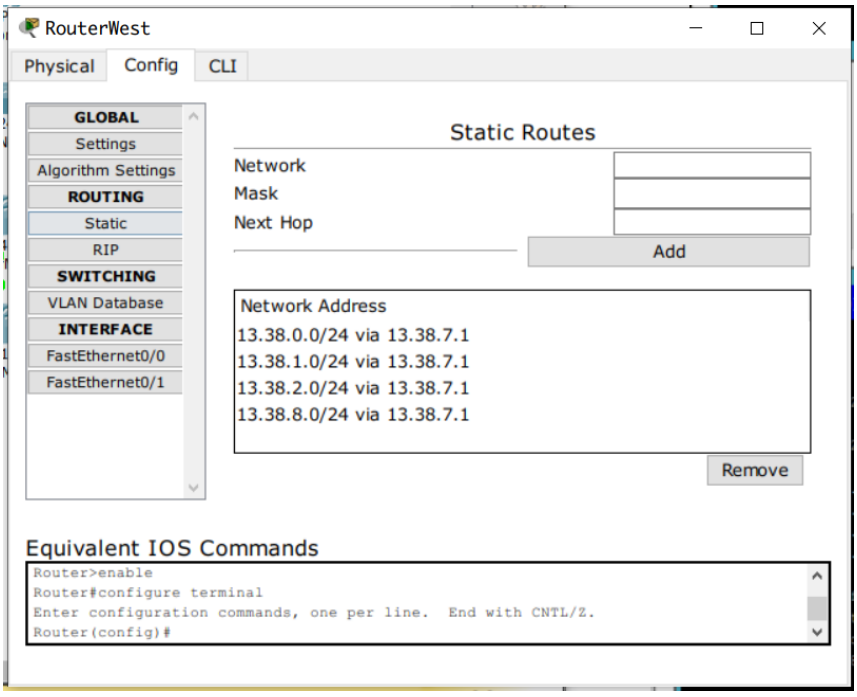
路由配置



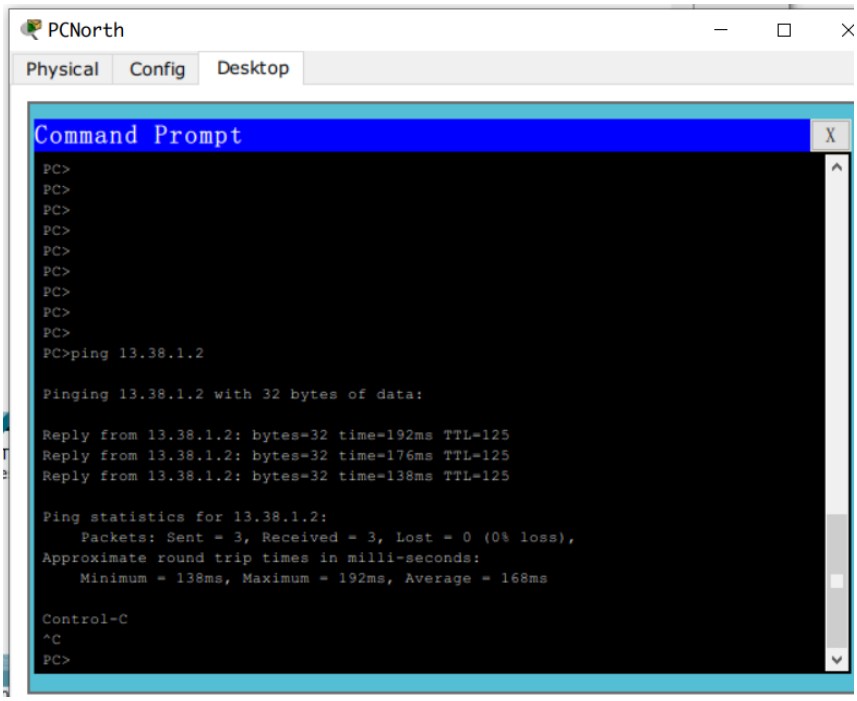

RouterEast
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
13.38.0.0/24 via 13.38.5.1
13.38.2.0/24 via 13.38.5.1
13.38.3.0/24 via 13.38.5.1
13.38.8.0/24 via 13.38.5.1
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#

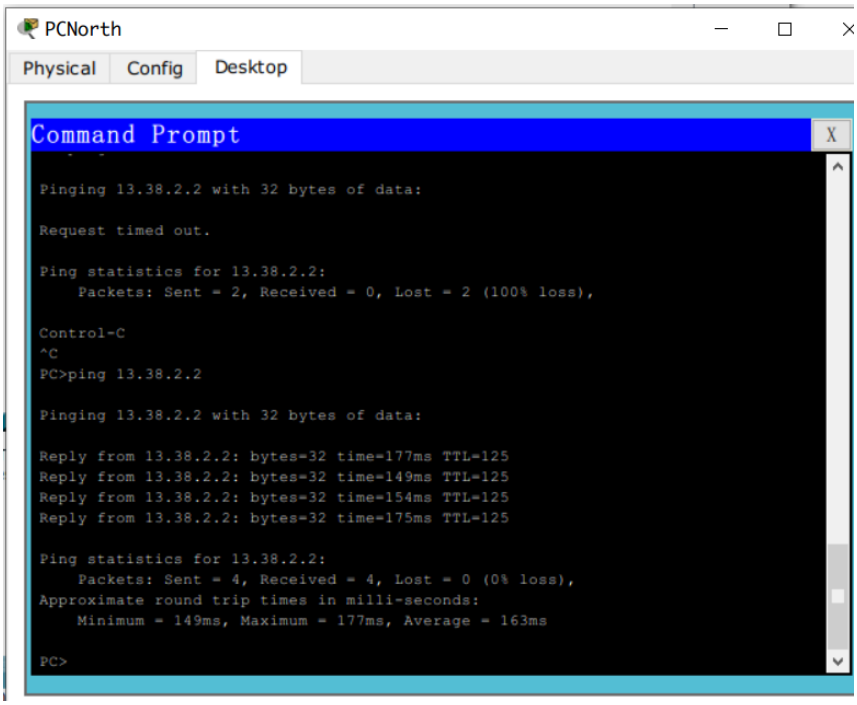

RouterMiddle
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Ethernet0/1/0
FastEthernet1/0
FastEthernet1/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
13.38.0.0/24 via 13.38.4.2
13.38.1.0/24 via 13.38.5.2
13.38.2.0/24 via 13.38.6.2
13.38.3.0/24 via 13.38.7.2
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#

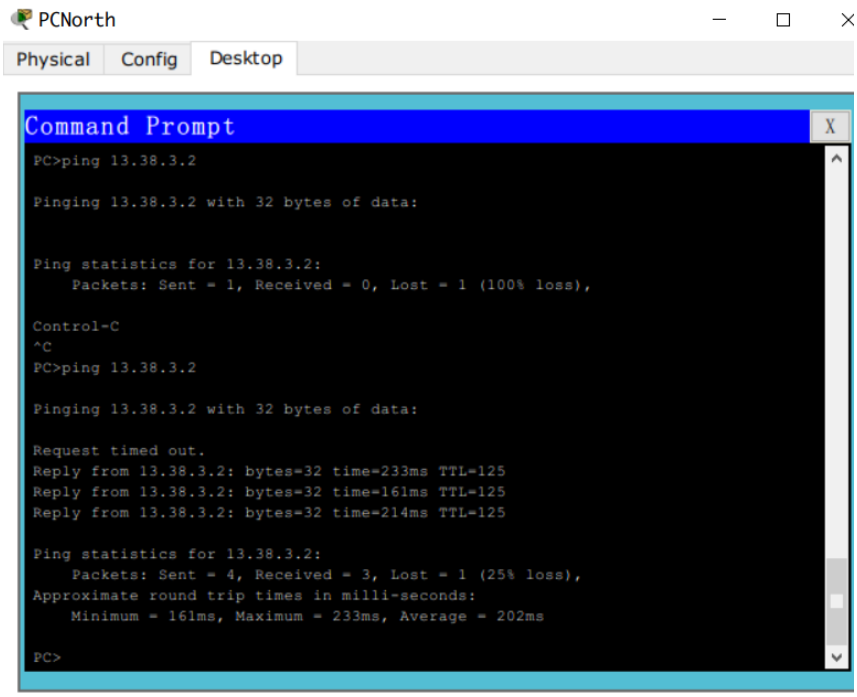

RouterSouth
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
13.38.0.0/24 via 13.38.6.1
13.38.1.0/24 via 13.38.6.1
13.38.3.0/24 via 13.38.6.1
13.38.8.0/24 via 13.38.6.1
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#

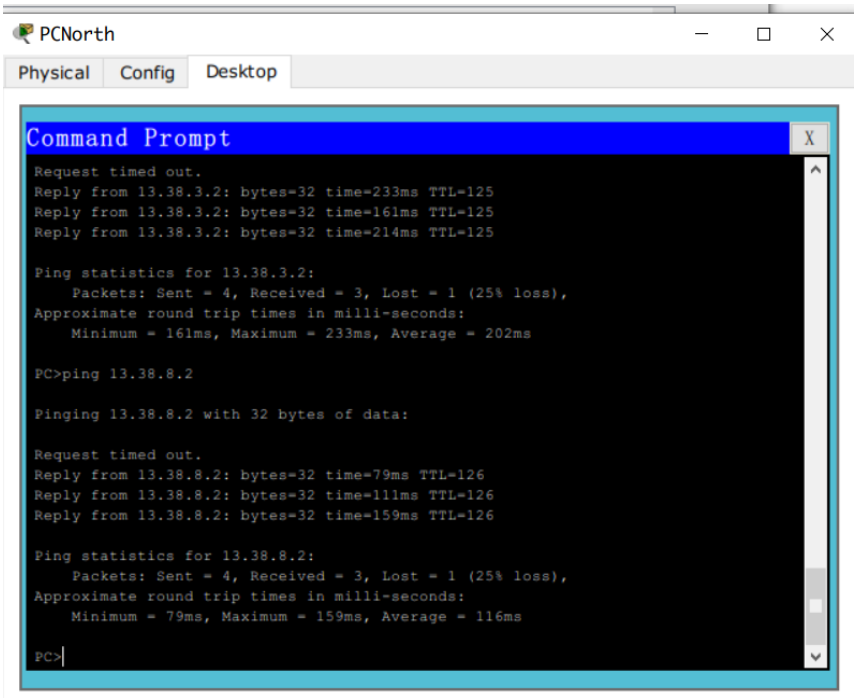

RouterWest
Physical
Config
CLI
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
13.38.0.0/24 via 13.38.7.1
13.38.1.0/24 via 13.38.7.1
13.38.2.0/24 via 13.38.7.1
13.38.8.0/24 via 13.38.7.1
Remove
Equivalent IOS Commands
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#

效果展示(以北区为例，其余见文件夹static下)



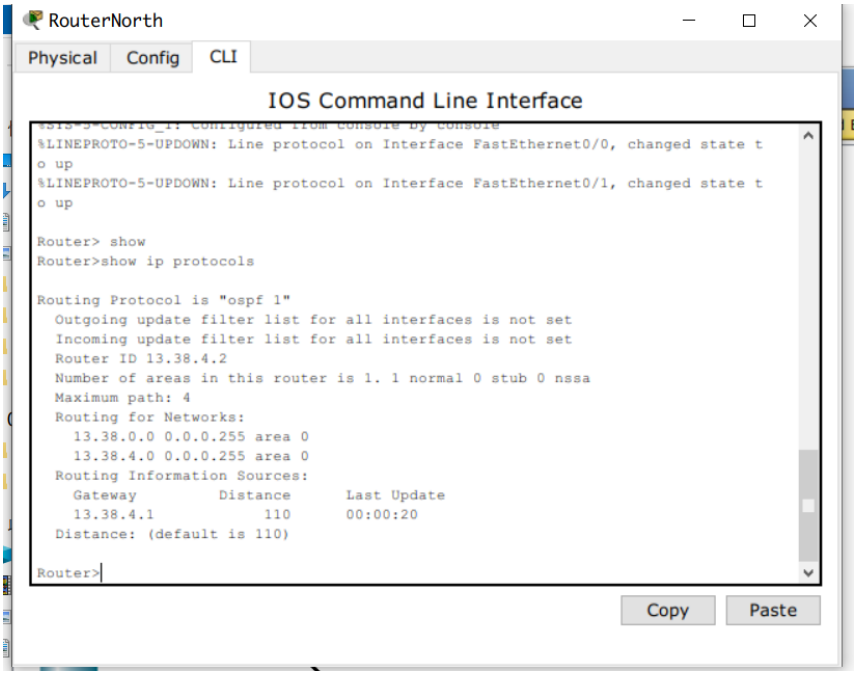


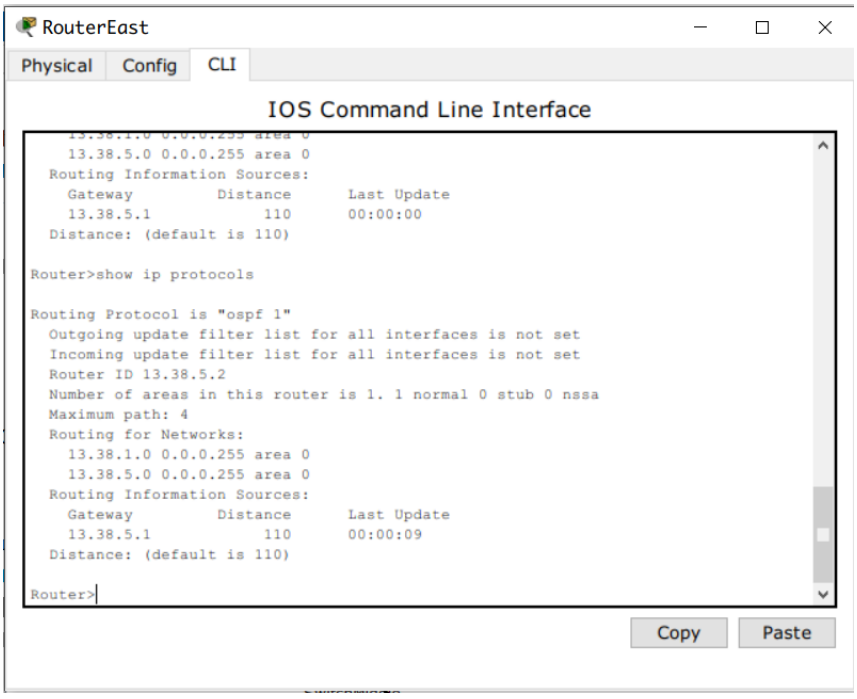

PCNorth
Physical
Config
Desktop
Command Prompt
PC>ping 13.38.3.2
Pinging 13.38.3.2 with 32 bytes of data:
Ping statistics for 13.38.3.2:
Packets: Sent = 1, Received = 0, Lost = 1 (100% loss),
Control-C
^C
PC>ping 13.38.3.2
Pinging 13.38.3.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.3.2: bytes=32 time=233ms TTL=125
Reply from 13.38.3.2: bytes=32 time=161ms TTL=125
Reply from 13.38.3.2: bytes=32 time=214ms TTL=125
Ping statistics for 13.38.3.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 161ms, Maximum = 233ms, Average = 202ms
PC>

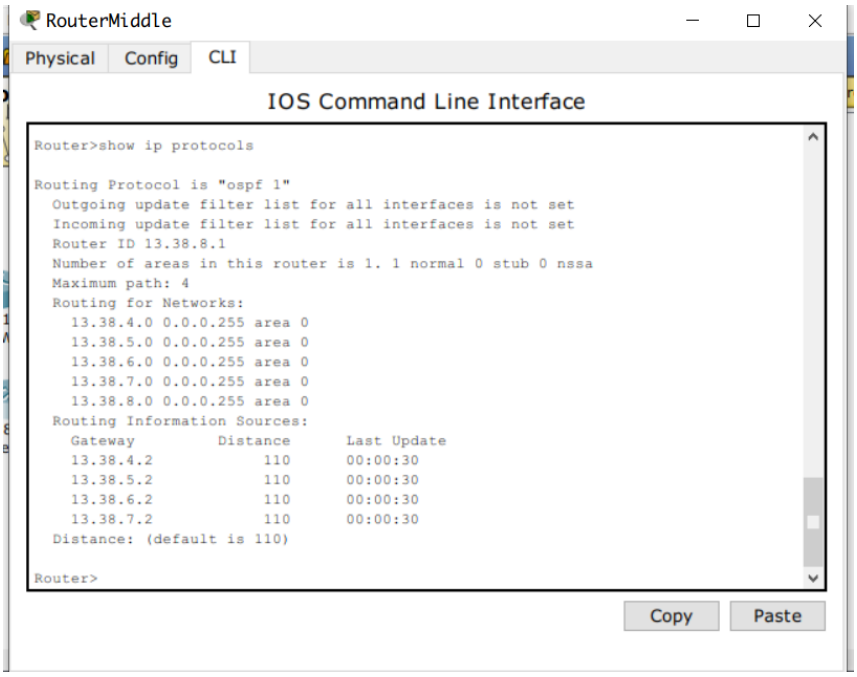

PCNorth
Physical
Config
Desktop
Command Prompt
Request timed out.
Reply from 13.38.3.2: bytes=32 time=233ms TTL=125
Reply from 13.38.3.2: bytes=32 time=161ms TTL=125
Reply from 13.38.3.2: bytes=32 time=214ms TTL=125
Ping statistics for 13.38.3.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 161ms, Maximum = 233ms, Average = 202ms
PC>ping 13.38.8.2
Pinging 13.38.8.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.8.2: bytes=32 time=79ms TTL=126
Reply from 13.38.8.2: bytes=32 time=111ms TTL=126
Reply from 13.38.8.2: bytes=32 time=159ms TTL=126
Ping statistics for 13.38.8.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 79ms, Maximum = 159ms, Average = 116ms
PC>

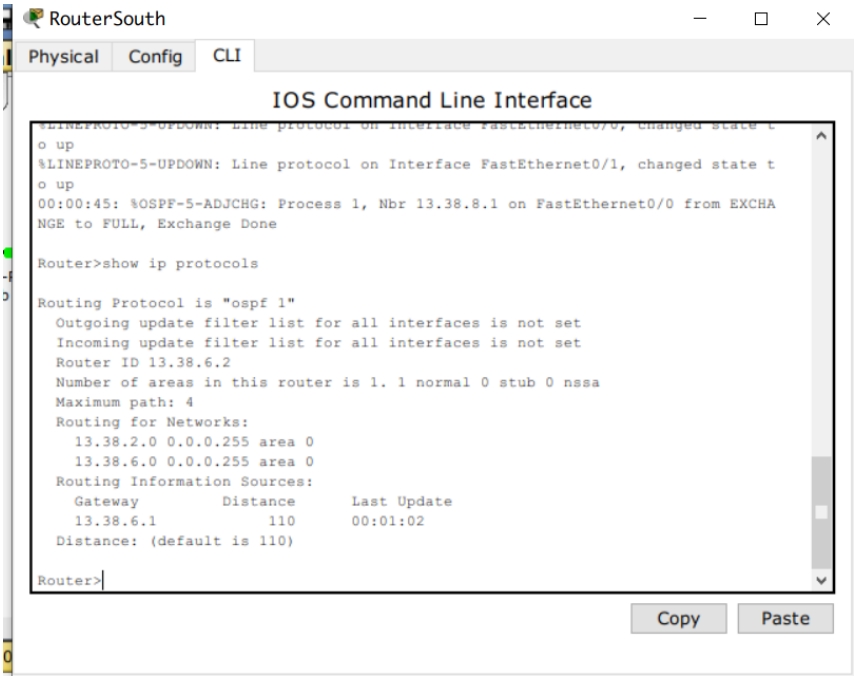
4.7 配置动态路由(OSPF)

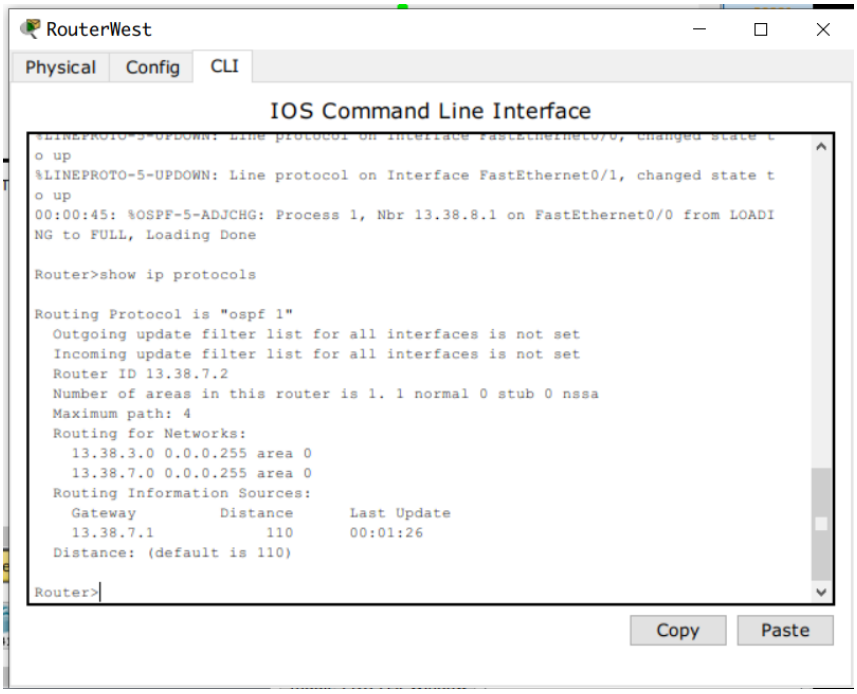
路由配置



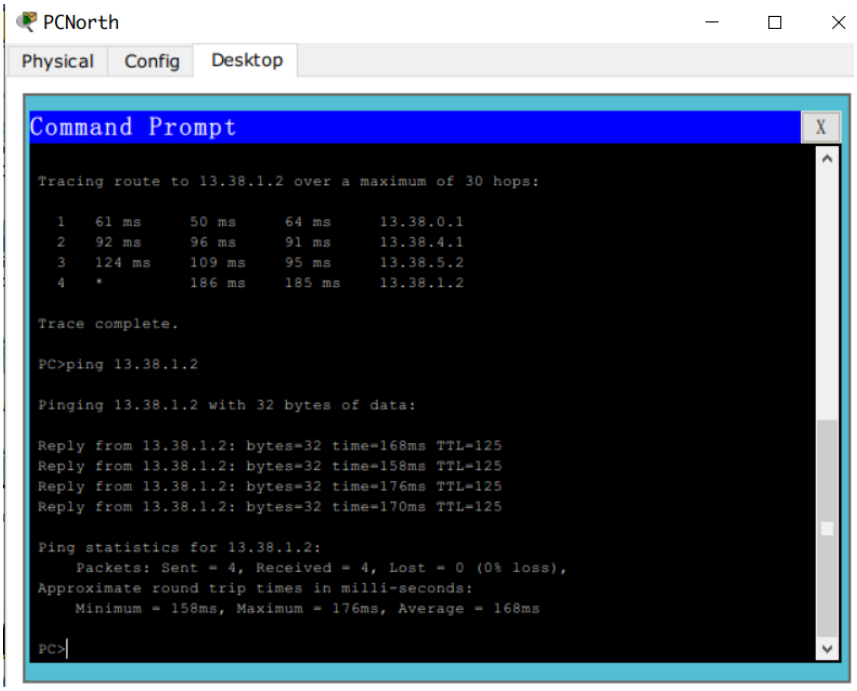


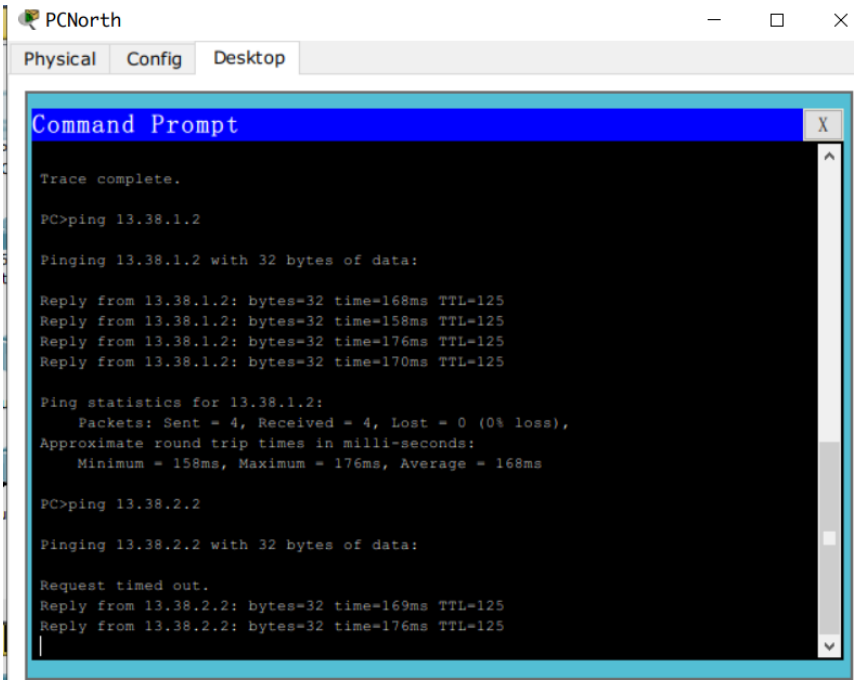

RouterMiddle
Physical
Config
CLI
IOS Command Line Interface
Router>show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 13.38.8.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
13.38.4.0 0.0.0.255 area 0
13.38.5.0 0.0.0.255 area 0
13.38.6.0 0.0.0.255 area 0
13.38.7.0 0.0.0.255 area 0
13.38.8.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
13.38.4.2 110 00:00:30
13.38.5.2 110 00:00:30
13.38.6.2 110 00:00:30
13.38.7.2 110 00:00:30
Distance: (default is 110)
Router>
Copy
Paste

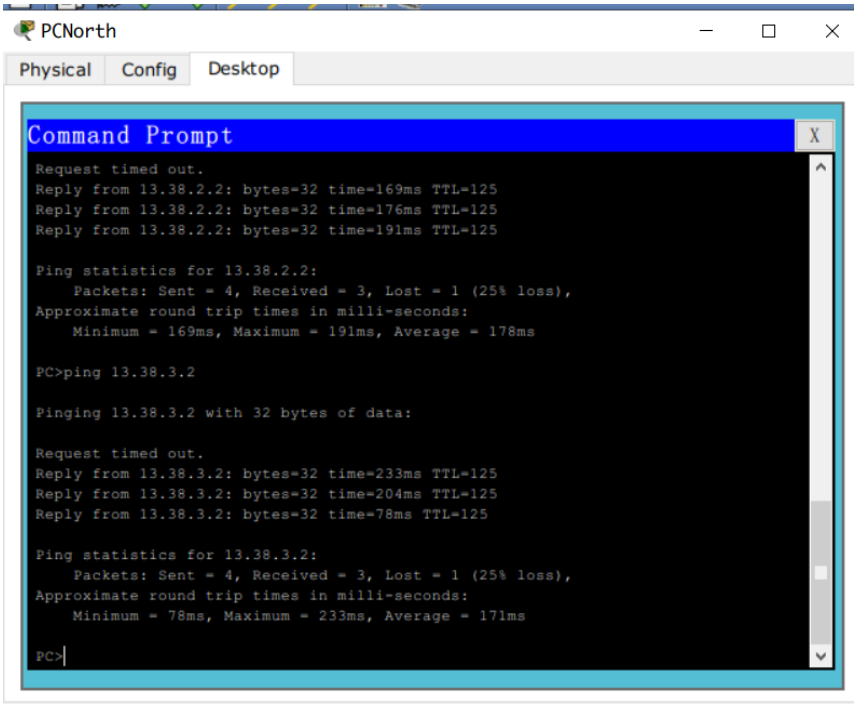

RouterSouth
Physical
Config
CLI
IOS Command Line Interface
o up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state t
o up
00:00:45: %OSPF-5-ADJCHG: Process 1, Nbr 13.38.8.1 on FastEthernet0/0 from EXCHA
NGE to FULL, Exchange Done
Router>show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 13.38.6.2
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
13.38.2.0 0.0.0.255 area 0
13.38.6.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
13.38.6.1 110 00:01:02
Distance: (default is 110)
Router>
Copy
Paste

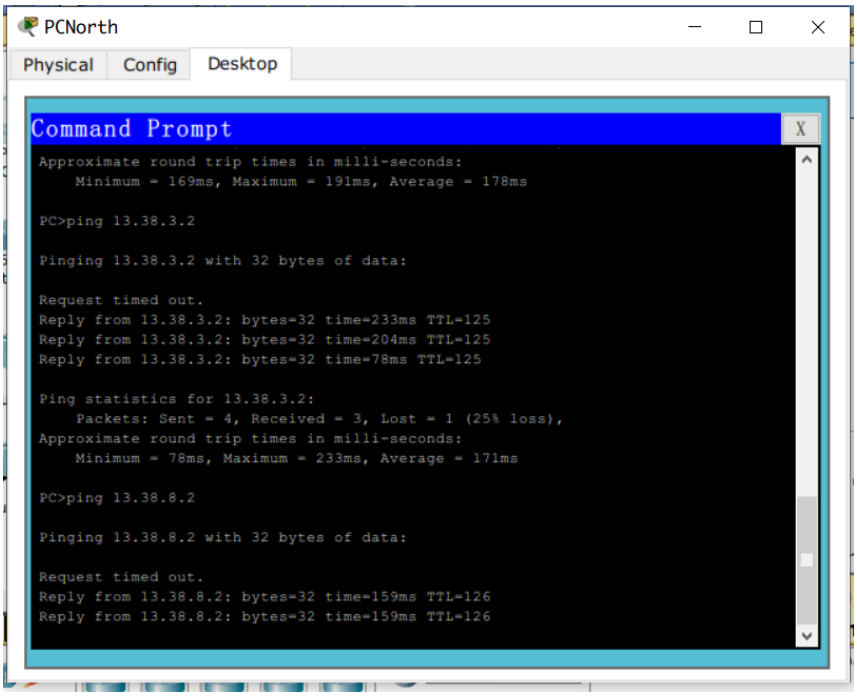


效果展示(以北区为例，其余见文件夹ospf下)




PCNorth
Physical
Config
Desktop
Command Prompt
Trace complete.
PC>ping 13.38.1.2
Pinging 13.38.1.2 with 32 bytes of data:
Reply from 13.38.1.2: bytes=32 time=168ms TTL=125
Reply from 13.38.1.2: bytes=32 time=158ms TTL=125
Reply from 13.38.1.2: bytes=32 time=176ms TTL=125
Reply from 13.38.1.2: bytes=32 time=170ms TTL=125
Ping statistics for 13.38.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 158ms, Maximum = 176ms, Average = 168ms
PC>ping 13.38.2.2
Pinging 13.38.2.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.2.2: bytes=32 time=169ms TTL=125
Reply from 13.38.2.2: bytes=32 time=176ms TTL=125


PCNorth
Physical
Config
Desktop
Command Prompt
Request timed out.
Reply from 13.38.2.2: bytes=32 time=169ms TTL=125
Reply from 13.38.2.2: bytes=32 time=176ms TTL=125
Reply from 13.38.2.2: bytes=32 time=191ms TTL=125
Ping statistics for 13.38.2.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 169ms, Maximum = 191ms, Average = 178ms
PC>ping 13.38.3.2
Pinging 13.38.3.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.3.2: bytes=32 time=233ms TTL=125
Reply from 13.38.3.2: bytes=32 time=204ms TTL=125
Reply from 13.38.3.2: bytes=32 time=78ms TTL=125
Ping statistics for 13.38.3.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 78ms, Maximum = 233ms, Average = 171ms
PC>


PCNorth
Physical
Config
Desktop
Command Prompt
X
Approximate round trip times in milli-seconds:
Minimum = 169ms, Maximum = 191ms, Average = 178ms
PC>ping 13.38.3.2
Pinging 13.38.3.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.3.2: bytes=32 time=233ms TTL=125
Reply from 13.38.3.2: bytes=32 time=204ms TTL=125
Reply from 13.38.3.2: bytes=32 time=78ms TTL=125
Ping statistics for 13.38.3.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 78ms, Maximum = 233ms, Average = 171ms
PC>ping 13.38.8.2
Pinging 13.38.8.2 with 32 bytes of data:
Request timed out.
Reply from 13.38.8.2: bytes=32 time=159ms TTL=126
Reply from 13.38.8.2: bytes=32 time=159ms TTL=126