必做：

子网划分

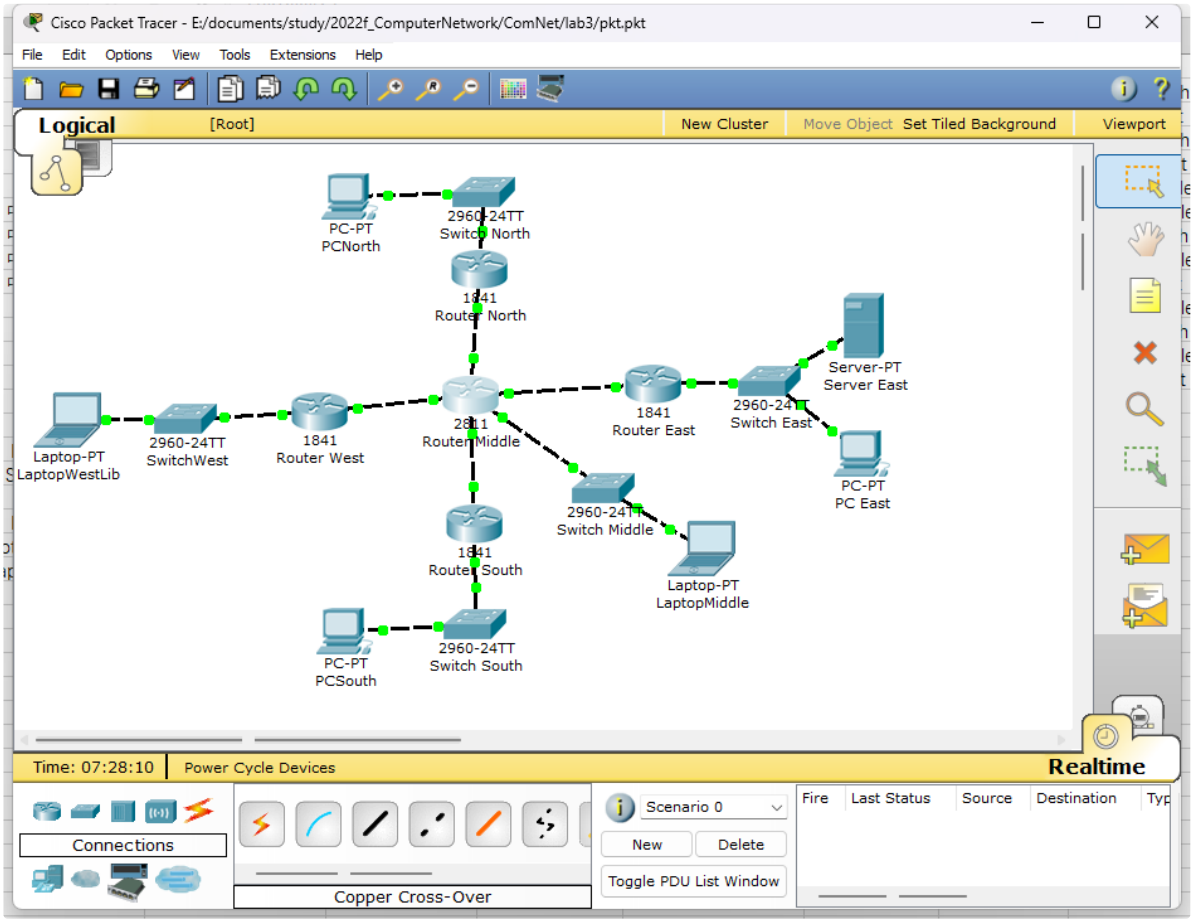
校区	子网
南区	110.7.0.0/24
东区	110.7.1.0/24
北区	110.7.2.0/24
西区	110.7.3.0/24
中区	110.7.8.0/24
中区-南区	110.7.4.0/24
中区-东区	110.7.5.0/24
中区-北区	110.7.6.0/24
中区-西区	110.7.7.0/24

接口Ip划分：

Device	Interface	IP Address	Mask	To Device	To Interface
Router Middle	FastEthernet0/0	110.7.4.1	255.255.255.0	Router South	FastEthernet0/0
	FastEthernet0/1	110.7.5.1	255.255.255.0	Router East	FastEthernet0/0
	FastEthernet1/0	110.7.6.1	255.255.255.0	Router North	FastEthernet0/0
	FastEthernet1/1	110.7.7.1	255.255.255.0	Router West	FastEthernet0/0
	Ethernet1/0/0	110.7.8.1	255.255.255.0	Switch Middle	
Router South	FastEthernet0/0	110.7.4.2	255.255.255.0	Router Middle	FastEthernet0/0
	FastEthernet0/1	110.7.0.1	255.255.255.0	Switch South	
Router East	FastEthernet0/0	110.7.5.2	255.255.255.0	Router Middle	FastEthernet0/1
	FastEthernet0/1	110.7.1.1	255.255.255.0	Switch East	
Router North	FastEthernet0/0	110.7.6.2	255.255.255.0	Router Middle	FastEthernet1/0
	FastEthernet0/1	110.7.2.1	255.255.255.0	Switch North	
Router West	FastEthernet0/0	110.7.7.2	255.255.255.0	Router Middle	FastEthernet1/1
	FastEthernet0/1	110.7.3.1	255.255.255.0	Switch West	

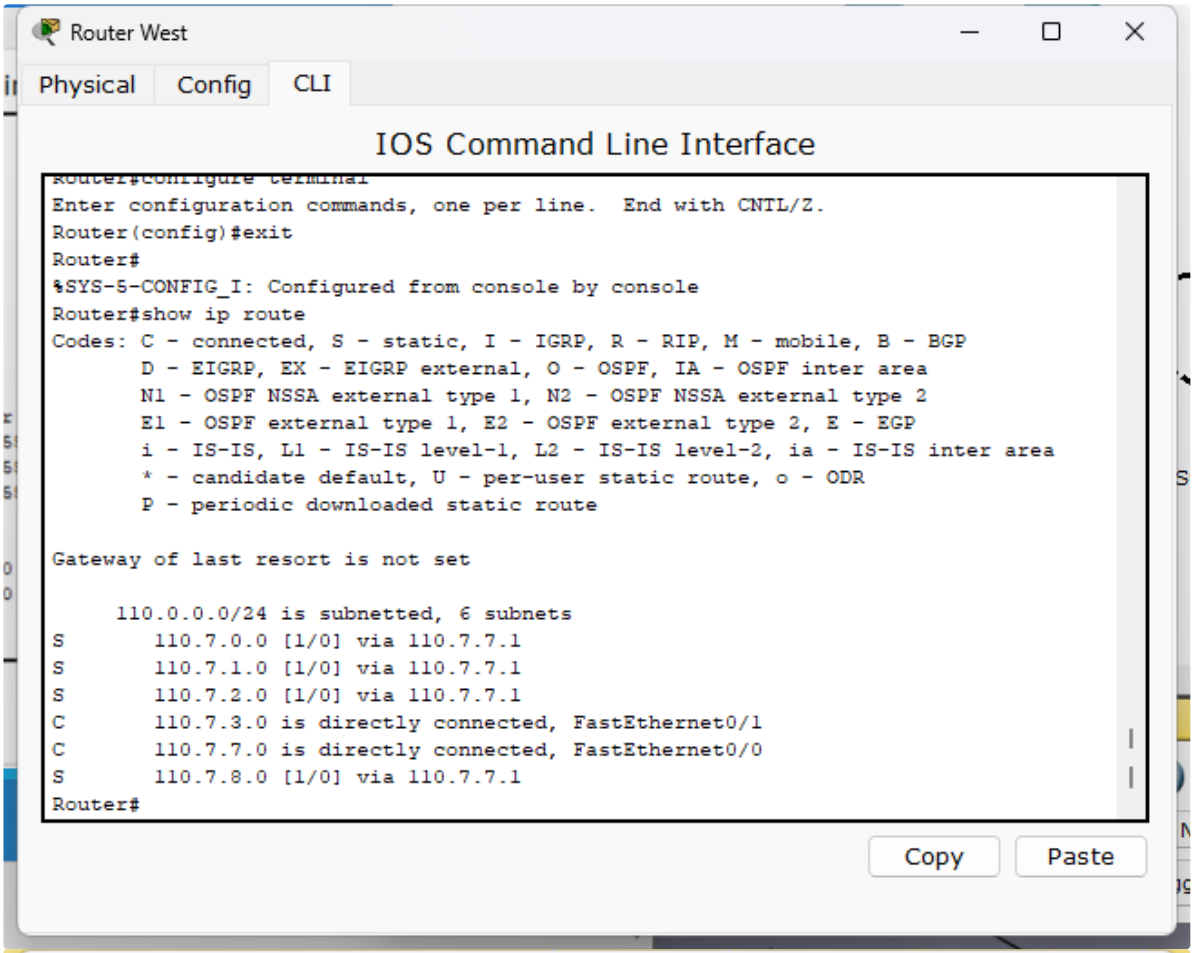
Device	IP Address	Mask	Gateway
PC South	110.7.0.2	255.255.255.0	110.7.0.1
Sever East	110.7.1.2	255.255.255.0	110.7.1.1
PC East	110.7.1.3	255.255.255.0	110.7.1.1
PC North	110.7.2.2	255.255.255.0	110.7.2.1
Laptop West Lib	110.7.3.2	255.255.255.0	110.7.3.1
Laptop Middle	110.7.8.2	255.255.255.0	110.7.8.1

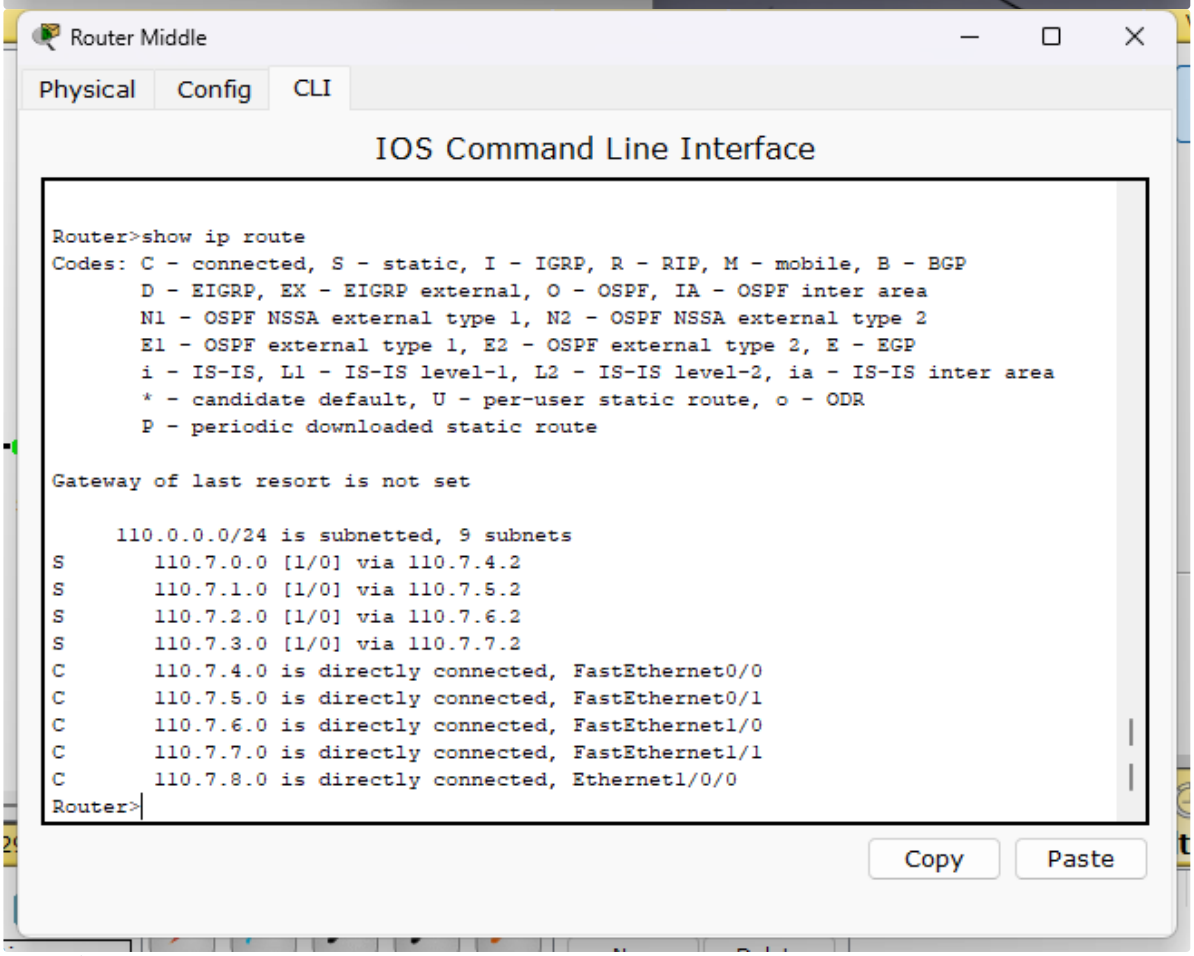
搭建结果：



静态路由：

仅使用指令展示其中两个路由器的结果，其他结果整合在excel表格中


Router West
Physical
Config
CLI
IOS Command Line Interface
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 6 subnets
S 110.7.0.0 [1/0] via 110.7.7.1
S 110.7.1.0 [1/0] via 110.7.7.1
S 110.7.2.0 [1/0] via 110.7.7.1
C 110.7.3.0 is directly connected, FastEthernet0/1
C 110.7.7.0 is directly connected, FastEthernet0/0
S 110.7.8.0 [1/0] via 110.7.7.1
Router#
Copy
Paste


Router Middle
Physical
Config
CLI
IOS Command Line Interface
Router>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 9 subnets
S 110.7.0.0 [1/0] via 110.7.4.2
S 110.7.1.0 [1/0] via 110.7.5.2
S 110.7.2.0 [1/0] via 110.7.6.2
S 110.7.3.0 [1/0] via 110.7.7.2
C 110.7.4.0 is directly connected, FastEthernet0/0
C 110.7.5.0 is directly connected, FastEthernet0/1
C 110.7.6.0 is directly connected, FastEthernet1/0
C 110.7.7.0 is directly connected, FastEthernet1/1
C 110.7.8.0 is directly connected, Ethernet1/0/0
Router>
Copy
Paste

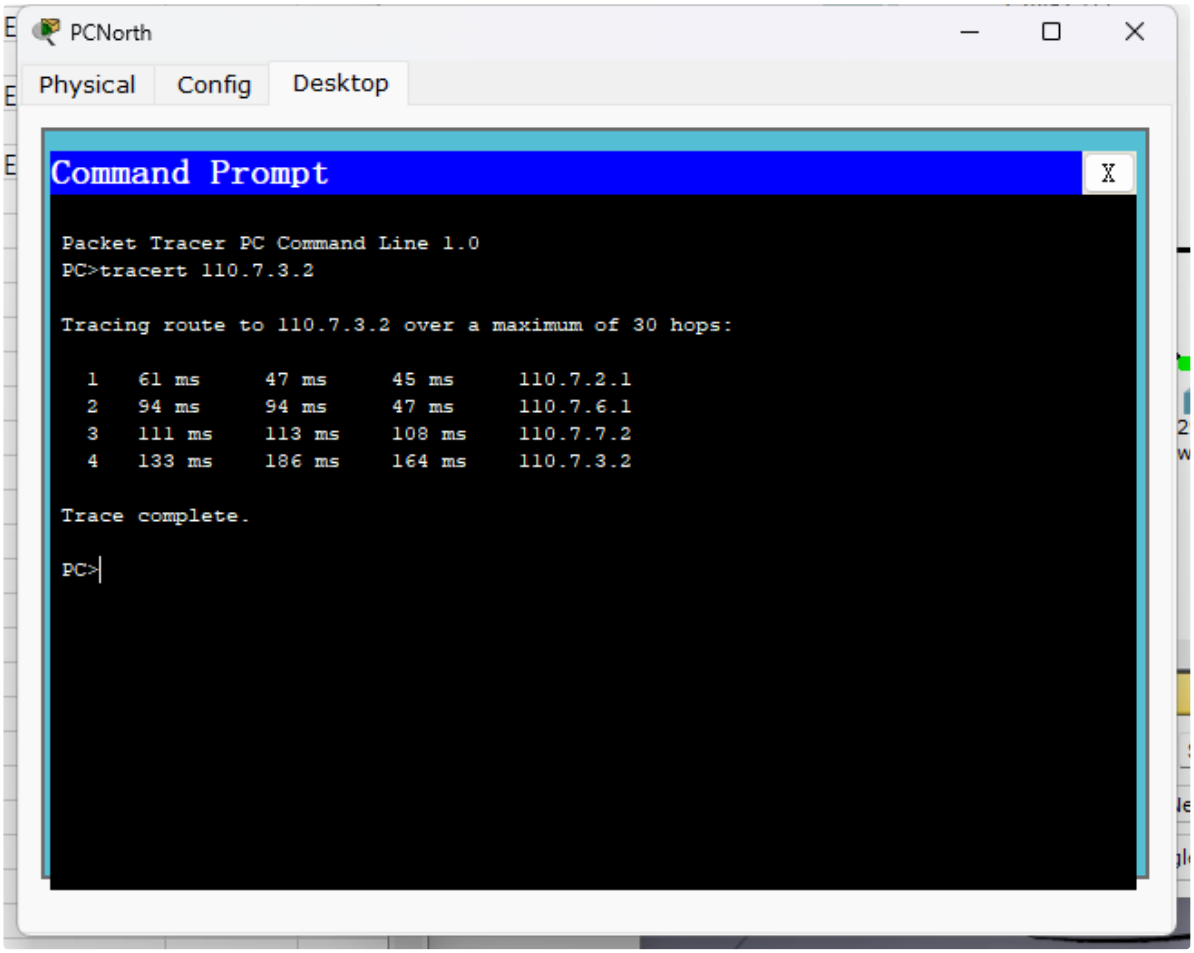
其他结果：

Router	Network	Mask	Next Hop
Router Middle	110.7.0.0	255.255.255.0	110.7.4.2
	110.7.1.0	255.255.255.0	110.7.5.2
	110.7.2.0	255.255.255.0	110.7.6.2
	110.7.3.0	255.255.255.0	110.7.7.2
	110.7.8.0	255.255.255.0	110.7.8.2
Router South	110.7.1.0	255.255.255.0	110.7.4.1
	110.7.2.0	255.255.255.0	110.7.4.1
	110.7.3.0	255.255.255.0	110.7.4.1
	110.7.8.0	255.255.255.0	110.7.4.1
Router East	110.7.0.0	255.255.255.0	110.7.5.1
	110.7.2.0	255.255.255.0	110.7.5.1
	110.7.3.0	255.255.255.0	110.7.5.1
	110.7.8.0	255.255.255.0	110.7.5.1
Router North	110.7.0.0	255.255.255.0	110.7.6.1
	110.7.1.0	255.255.255.0	110.7.6.1
	110.7.3.0	255.255.255.0	110.7.6.1
	110.7.8.0	255.255.255.0	110.7.6.1
Router West	110.7.0.0	255.255.255.0	110.7.7.1
	110.7.1.0	255.255.255.0	110.7.7.1
	110.7.2.0	255.255.255.0	110.7.7.1
	110.7.8.0	255.255.255.0	110.7.7.1

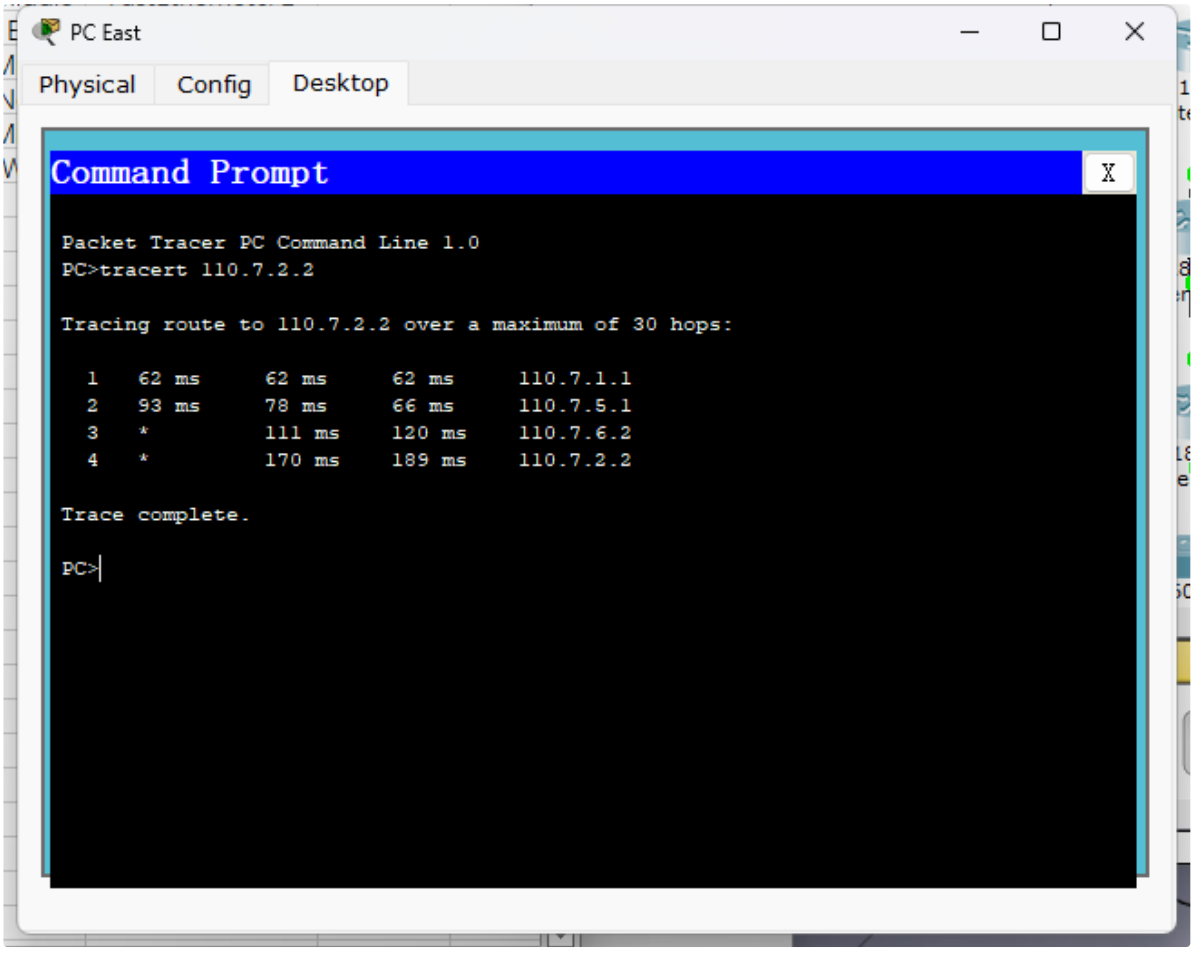
静态路由下连通性测试：

采用环路测试，每个终端ping逆时针顺序的下一个终端（东区有两台设备，任选其一）

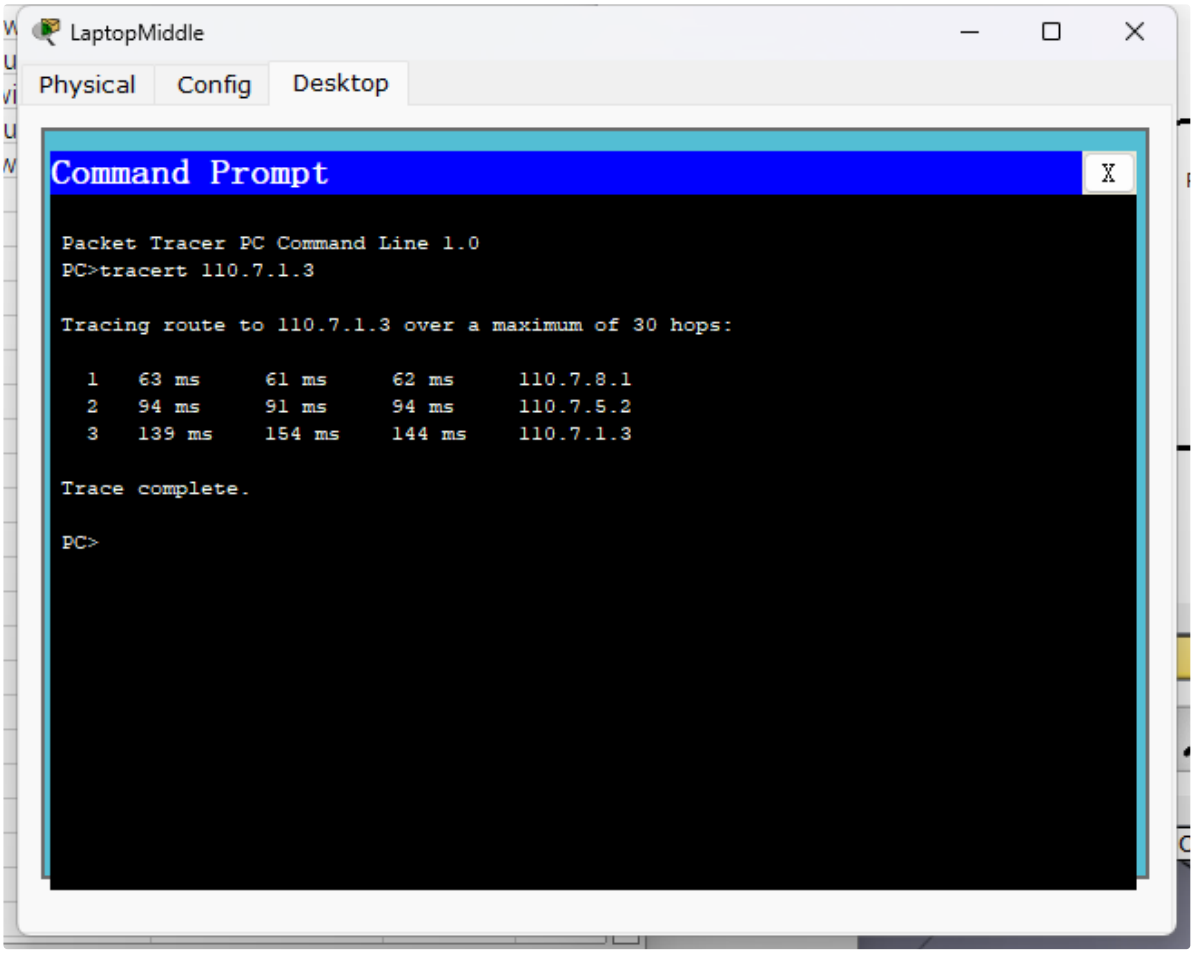
1. 北到西


PCNorth
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.3.2
Tracing route to 110.7.3.2 over a maximum of 30 hops:
1 61 ms 47 ms 45 ms 110.7.2.1
2 94 ms 94 ms 47 ms 110.7.6.1
3 111 ms 113 ms 108 ms 110.7.7.2
4 133 ms 186 ms 164 ms 110.7.3.2
Trace complete.
PC>

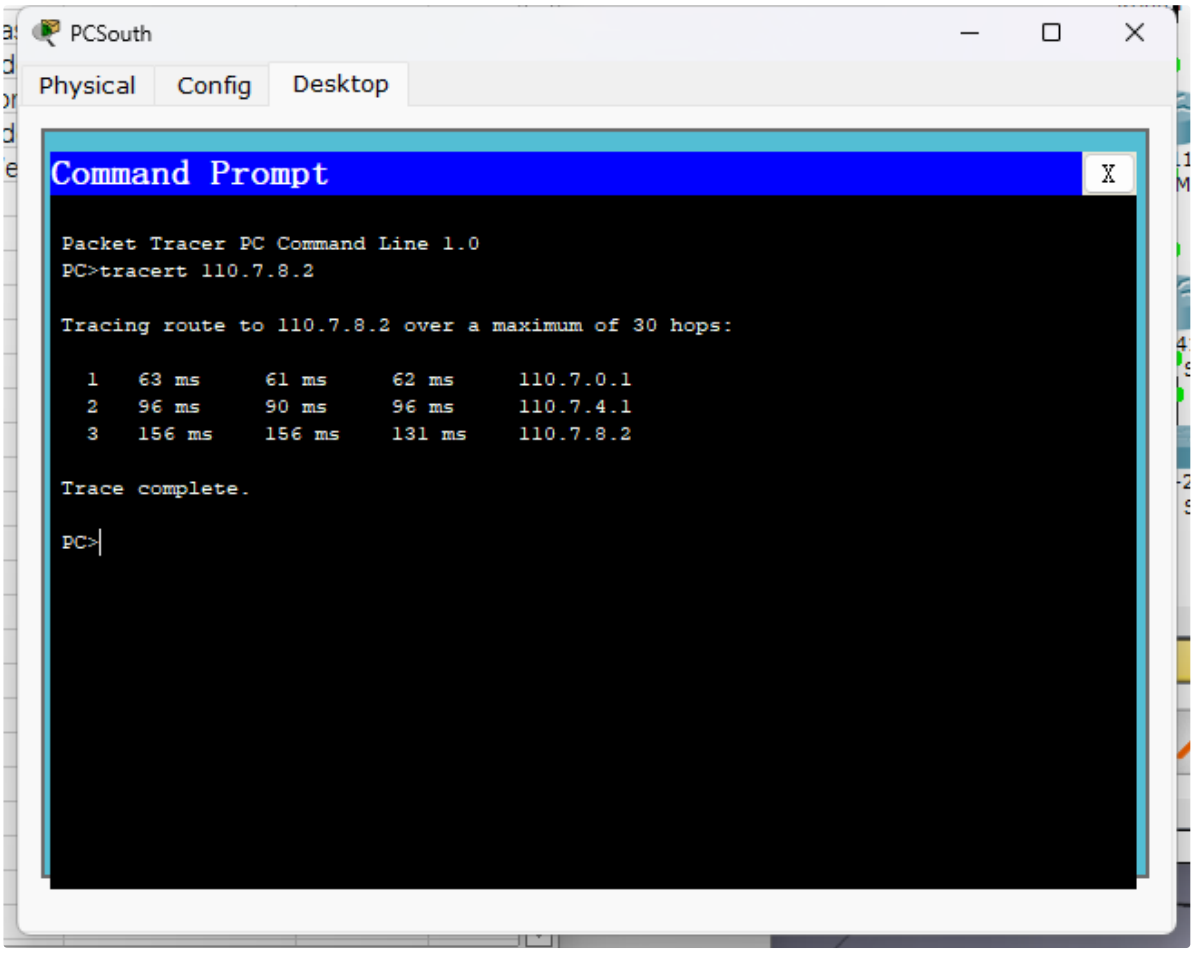
2. 东到北


PC East
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.2.2
Tracing route to 110.7.2.2 over a maximum of 30 hops:
1 62 ms 62 ms 62 ms 110.7.1.1
2 93 ms 78 ms 66 ms 110.7.5.1
3 * 111 ms 120 ms 110.7.6.2
4 * 170 ms 189 ms 110.7.2.2
Trace complete.
PC>

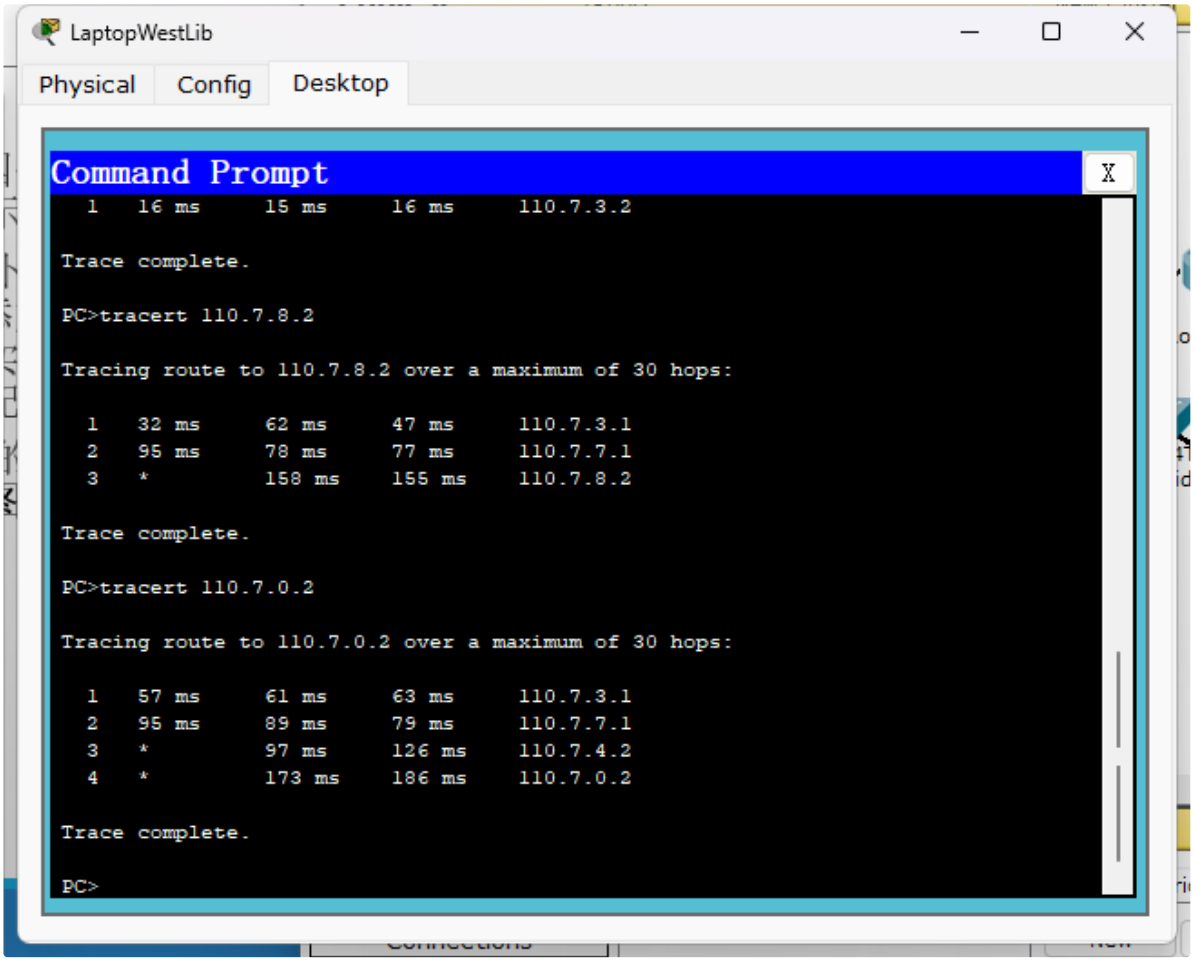
3. 中到东


LaptopMiddle
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.1.3
Tracing route to 110.7.1.3 over a maximum of 30 hops:
1 63 ms 61 ms 62 ms 110.7.8.1
2 94 ms 91 ms 94 ms 110.7.5.2
3 139 ms 154 ms 144 ms 110.7.1.3
Trace complete.
PC>

4. 南到中


PCSouth
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.8.2
Tracing route to 110.7.8.2 over a maximum of 30 hops:
1 63 ms 61 ms 62 ms 110.7.0.1
2 96 ms 90 ms 96 ms 110.7.4.1
3 156 ms 156 ms 131 ms 110.7.8.2
Trace complete.
PC>

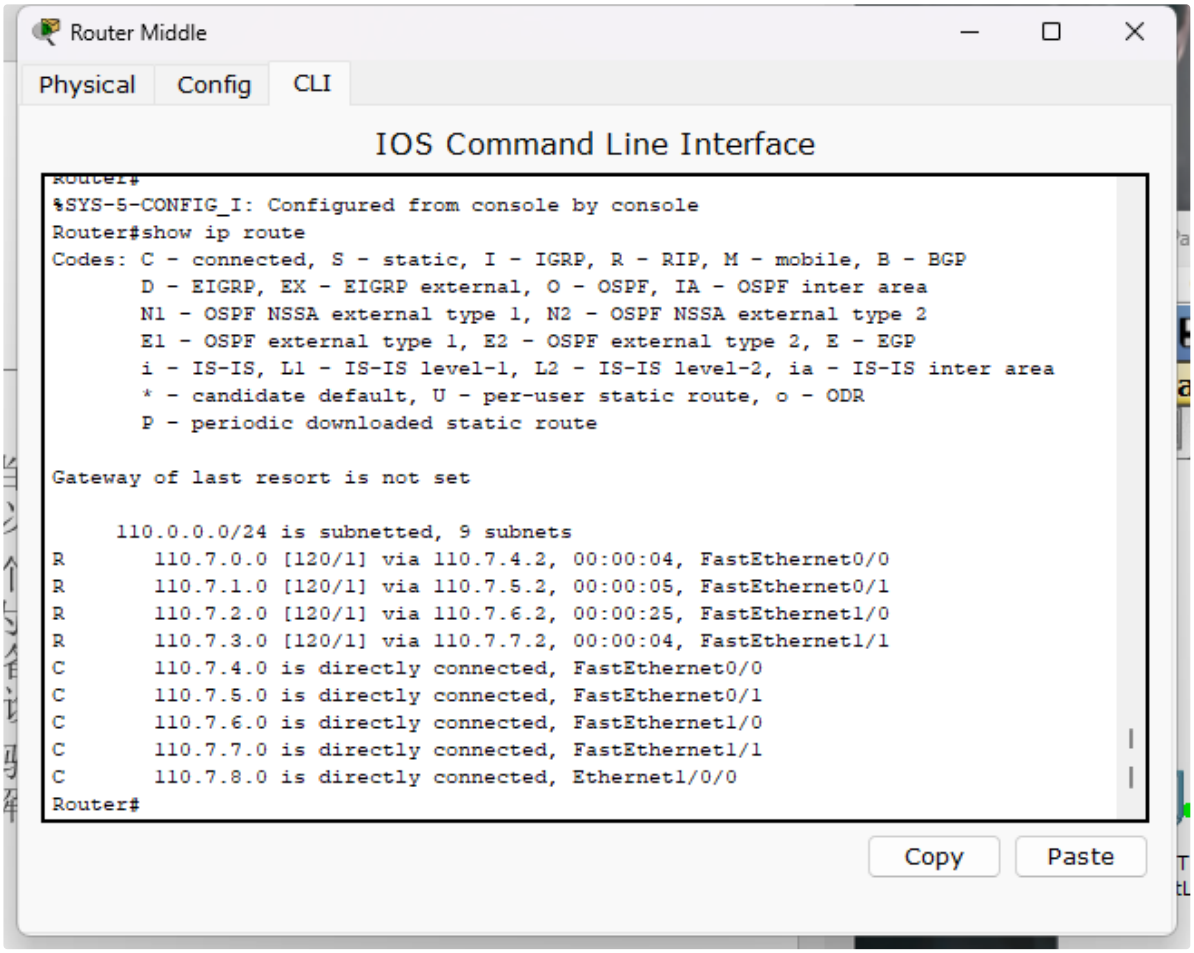
5. 西到南



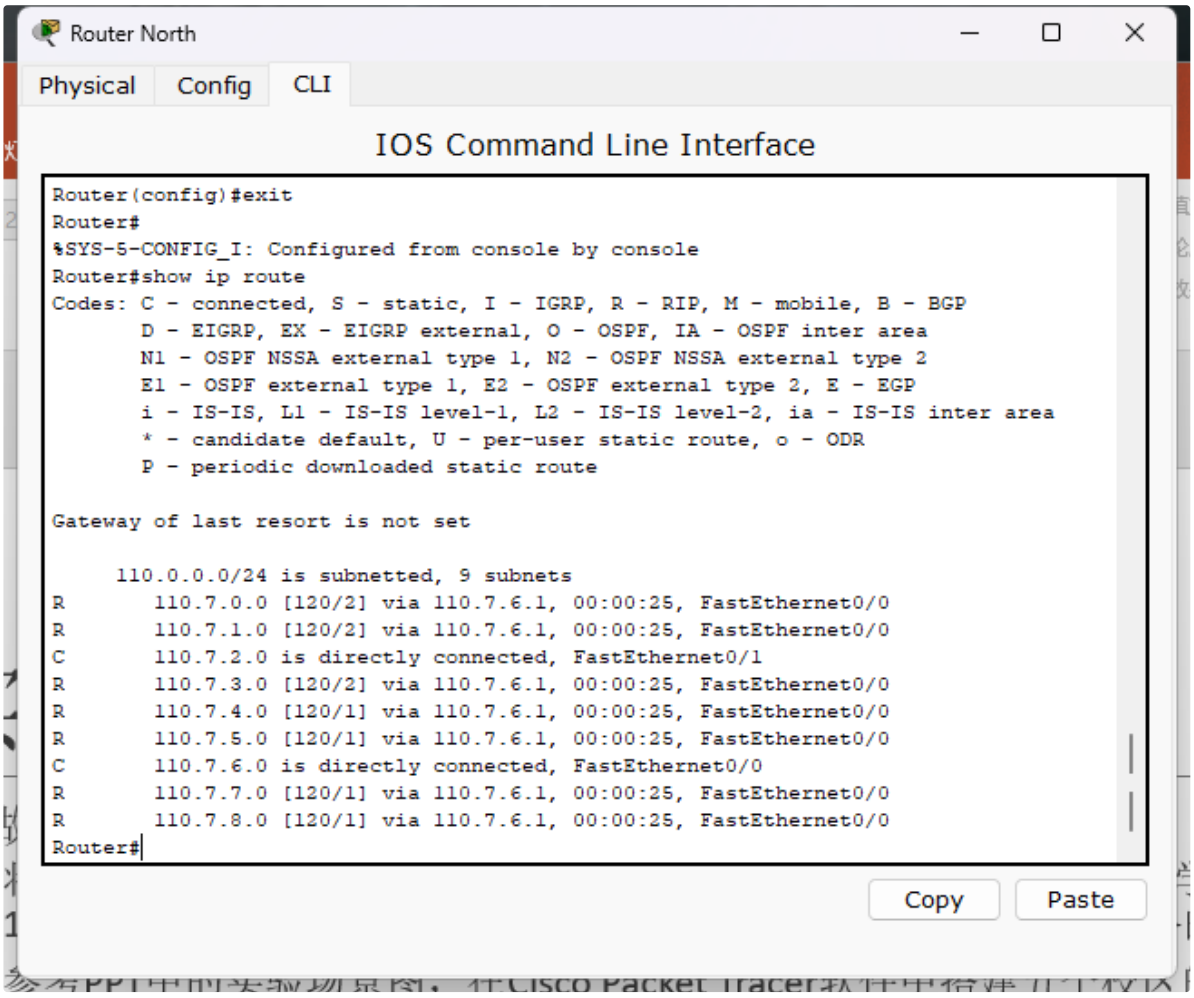
RIP：

路由转发表信息：

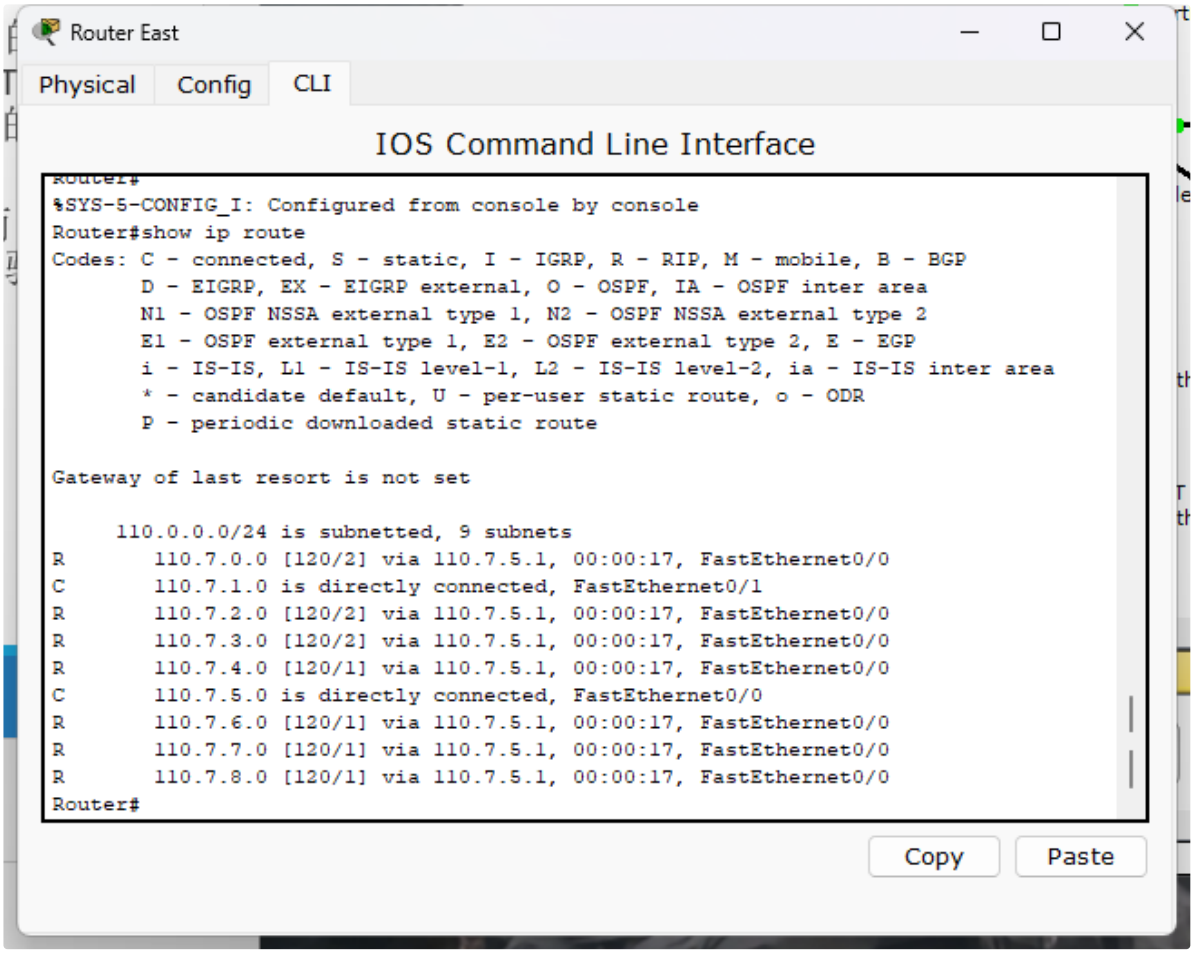
1. 中


Router Middle
Physical
Config
CLI
IOS Command Line Interface
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 9 subnets
R 110.7.0.0 [120/1] via 110.7.4.2, 00:00:04, FastEthernet0/0
R 110.7.1.0 [120/1] via 110.7.5.2, 00:00:05, FastEthernet0/1
R 110.7.2.0 [120/1] via 110.7.6.2, 00:00:25, FastEthernet1/0
R 110.7.3.0 [120/1] via 110.7.7.2, 00:00:04, FastEthernet1/1
C 110.7.4.0 is directly connected, FastEthernet0/0
C 110.7.5.0 is directly connected, FastEthernet0/1
C 110.7.6.0 is directly connected, FastEthernet1/0
C 110.7.7.0 is directly connected, FastEthernet1/1
C 110.7.8.0 is directly connected, Ethernet1/0/0
Router#
Copy
Paste

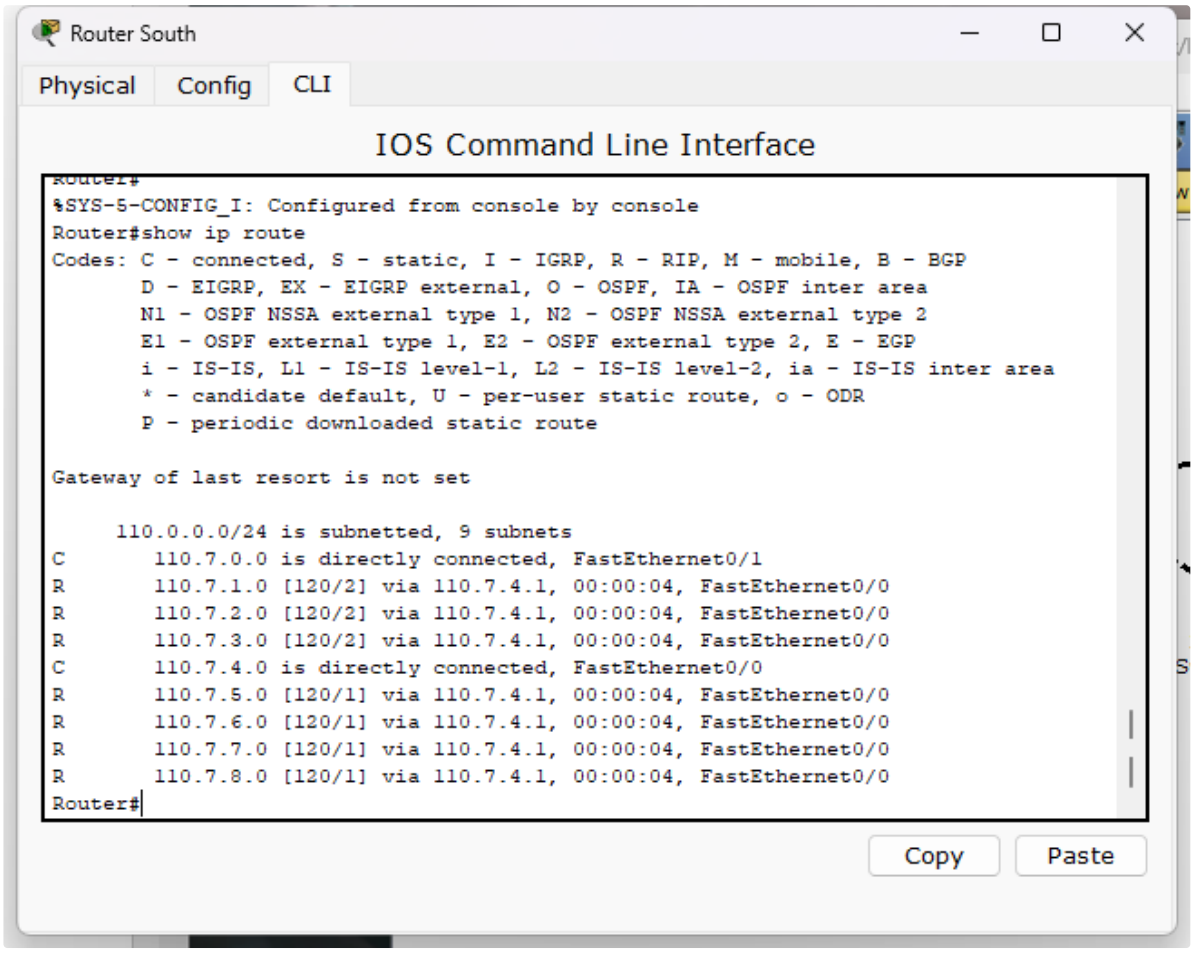
2. 北


Router North
Physical
Config
CLI
IOS Command Line Interface
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 9 subnets
R 110.7.0.0 [120/2] via 110.7.6.1, 00:00:25, FastEthernet0/0
R 110.7.1.0 [120/2] via 110.7.6.1, 00:00:25, FastEthernet0/0
C 110.7.2.0 is directly connected, FastEthernet0/1
R 110.7.3.0 [120/2] via 110.7.6.1, 00:00:25, FastEthernet0/0
R 110.7.4.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
R 110.7.5.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
C 110.7.6.0 is directly connected, FastEthernet0/0
R 110.7.7.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
Router#
Copy
Paste

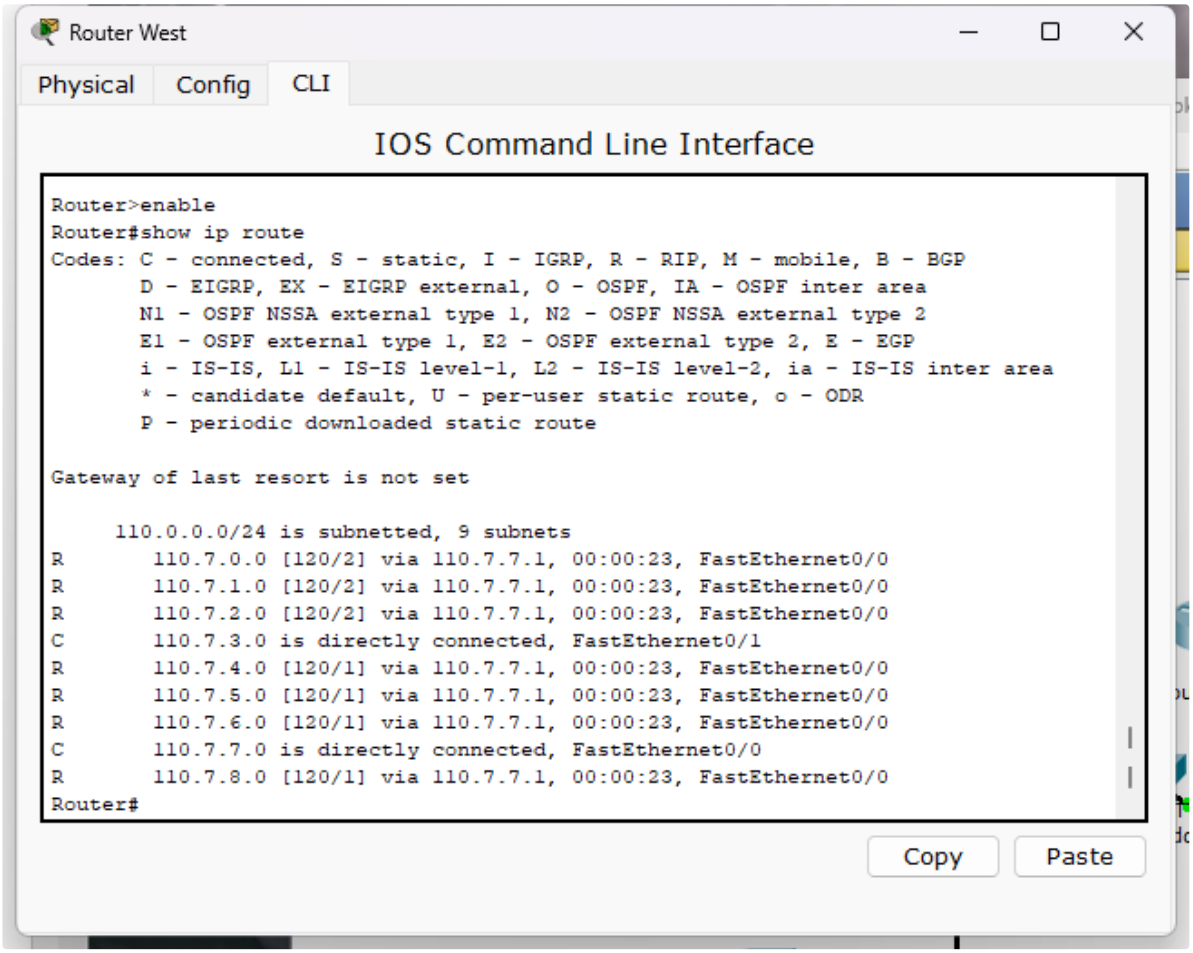
3. 东


Router East
Physical
Config
CLI
IOS Command Line Interface
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 9 subnets
R 110.7.0.0 [120/2] via 110.7.5.1, 00:00:17, FastEthernet0/0
C 110.7.1.0 is directly connected, FastEthernet0/1
R 110.7.2.0 [120/2] via 110.7.5.1, 00:00:17, FastEthernet0/0
R 110.7.3.0 [120/2] via 110.7.5.1, 00:00:17, FastEthernet0/0
R 110.7.4.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
C 110.7.5.0 is directly connected, FastEthernet0/0
R 110.7.6.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
R 110.7.7.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
Router#
Copy
Paste

4. 南

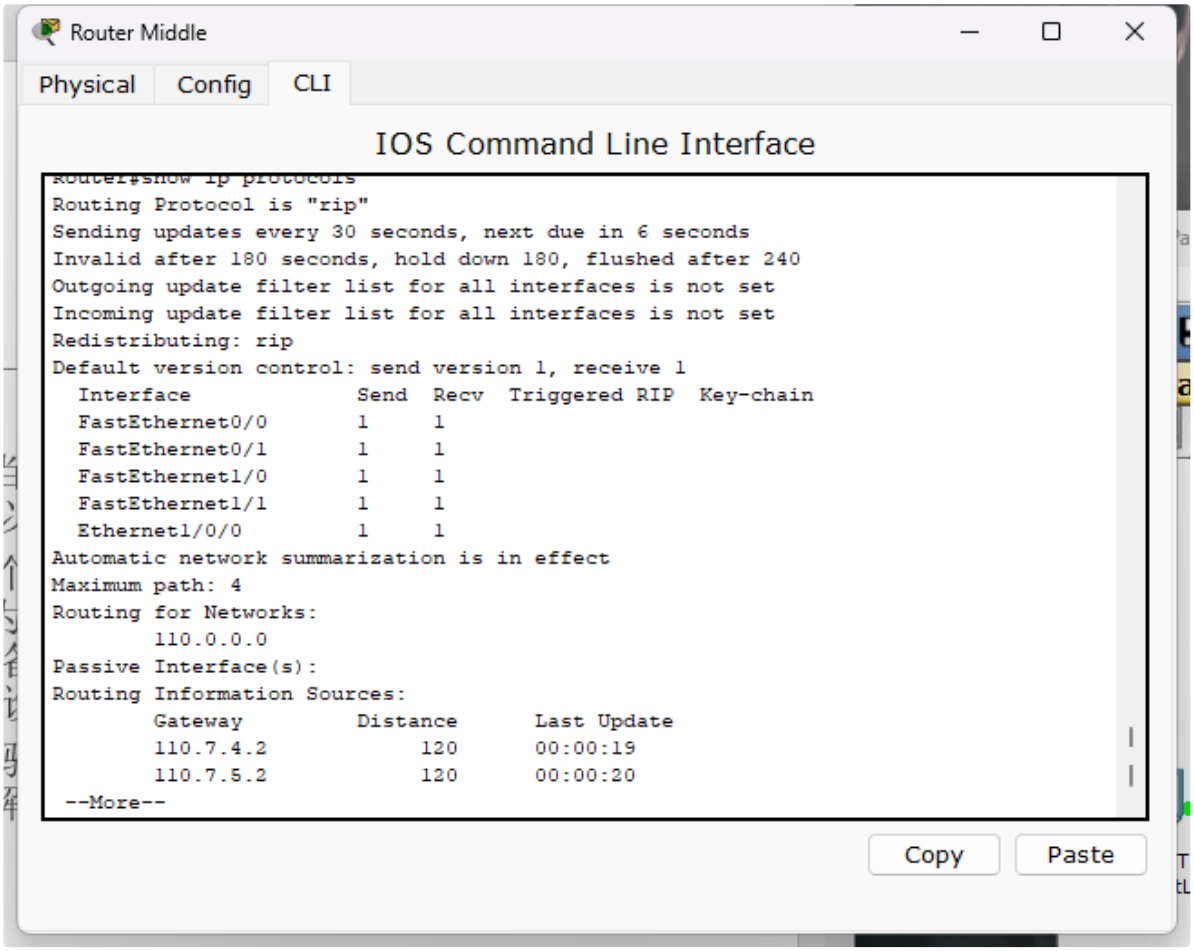

Router South
Physical
Config
CLI
IOS Command Line Interface
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
110.0.0.0/24 is subnetted, 9 subnets
C 110.7.0.0 is directly connected, FastEthernet0/1
R 110.7.1.0 [120/2] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.2.0 [120/2] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.3.0 [120/2] via 110.7.4.1, 00:00:04, FastEthernet0/0
C 110.7.4.0 is directly connected, FastEthernet0/0
R 110.7.5.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.6.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.7.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
Router#
Copy
Paste

5. 西

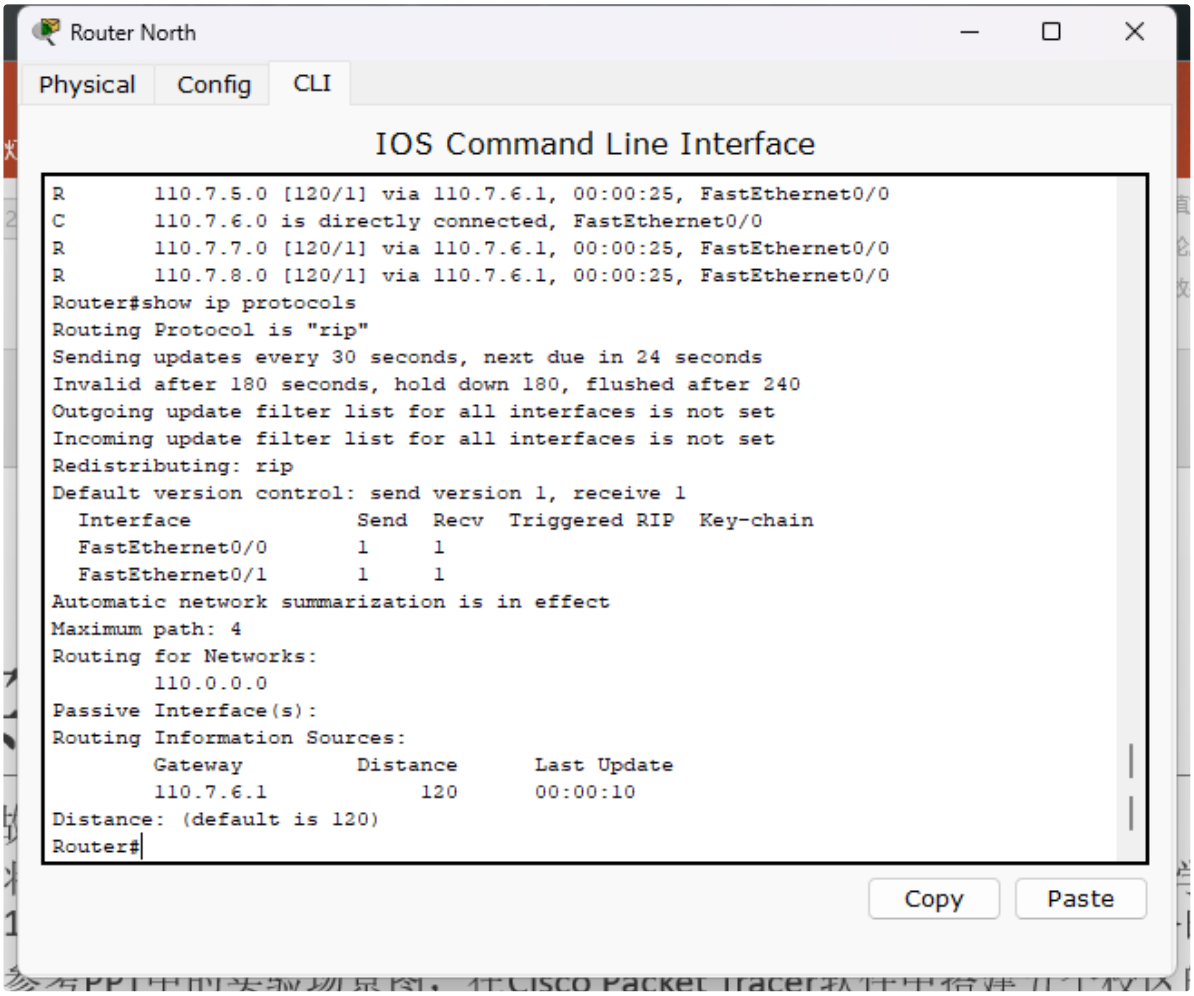


路由protocol信息：

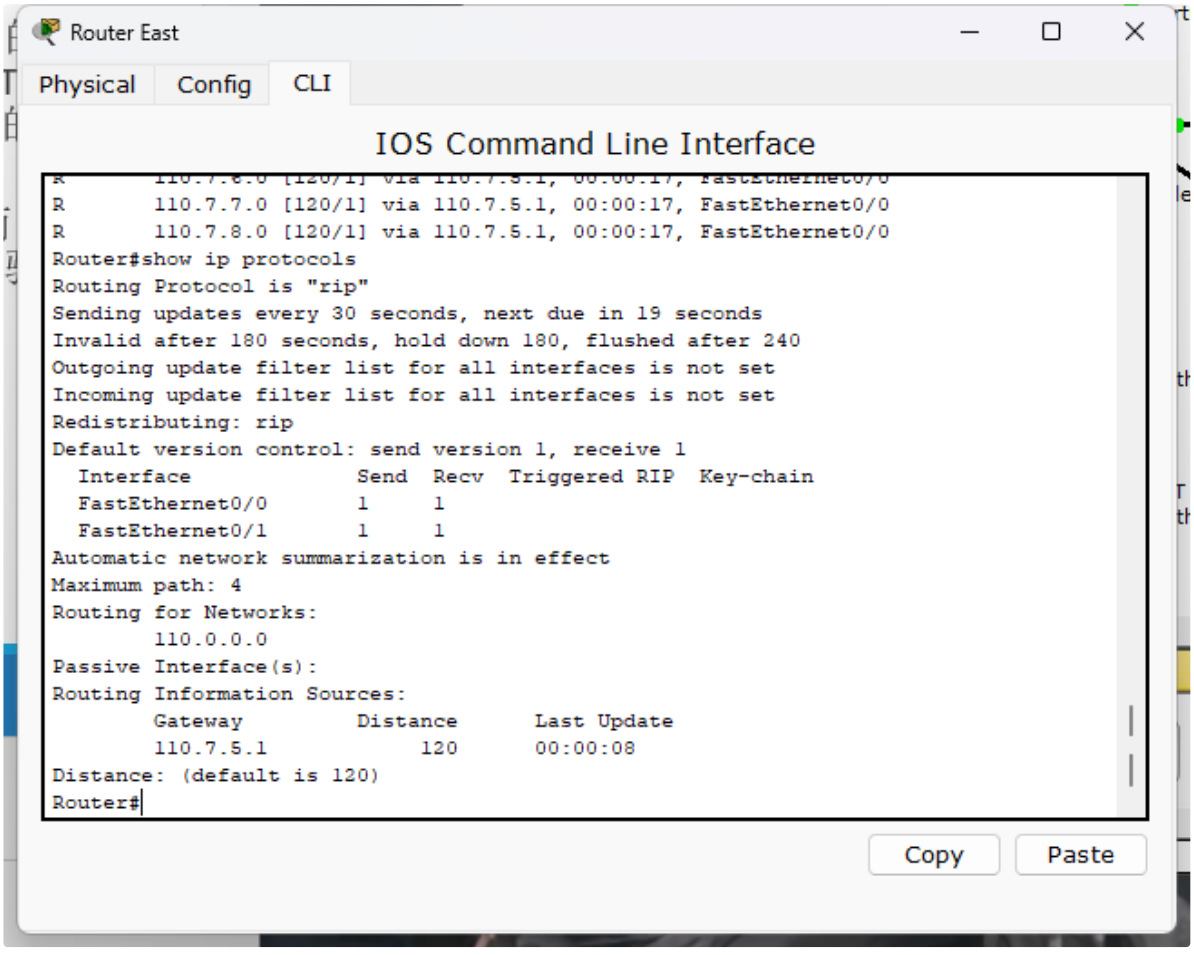
1. 中



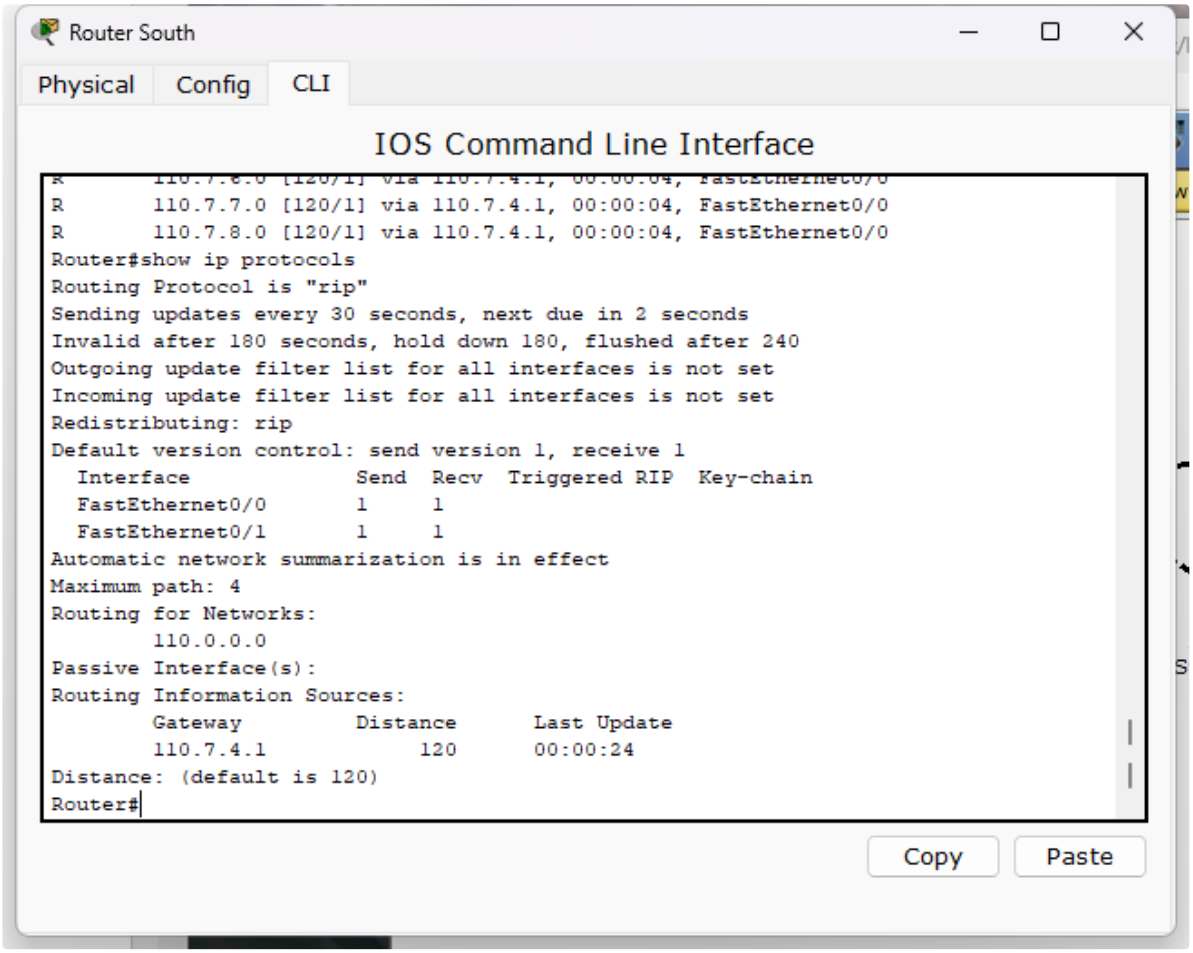
2. 北


Router North
Physical
Config
CLI
IOS Command Line Interface
R 110.7.5.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
C 110.7.6.0 is directly connected, FastEthernet0/0
R 110.7.7.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.6.1, 00:00:25, FastEthernet0/0
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 24 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive 1
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 1
FastEthernet0/1 1 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
110.0.0.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
110.7.6.1 120 00:00:10
Distance: (default is 120)
Router#
Copy
Paste

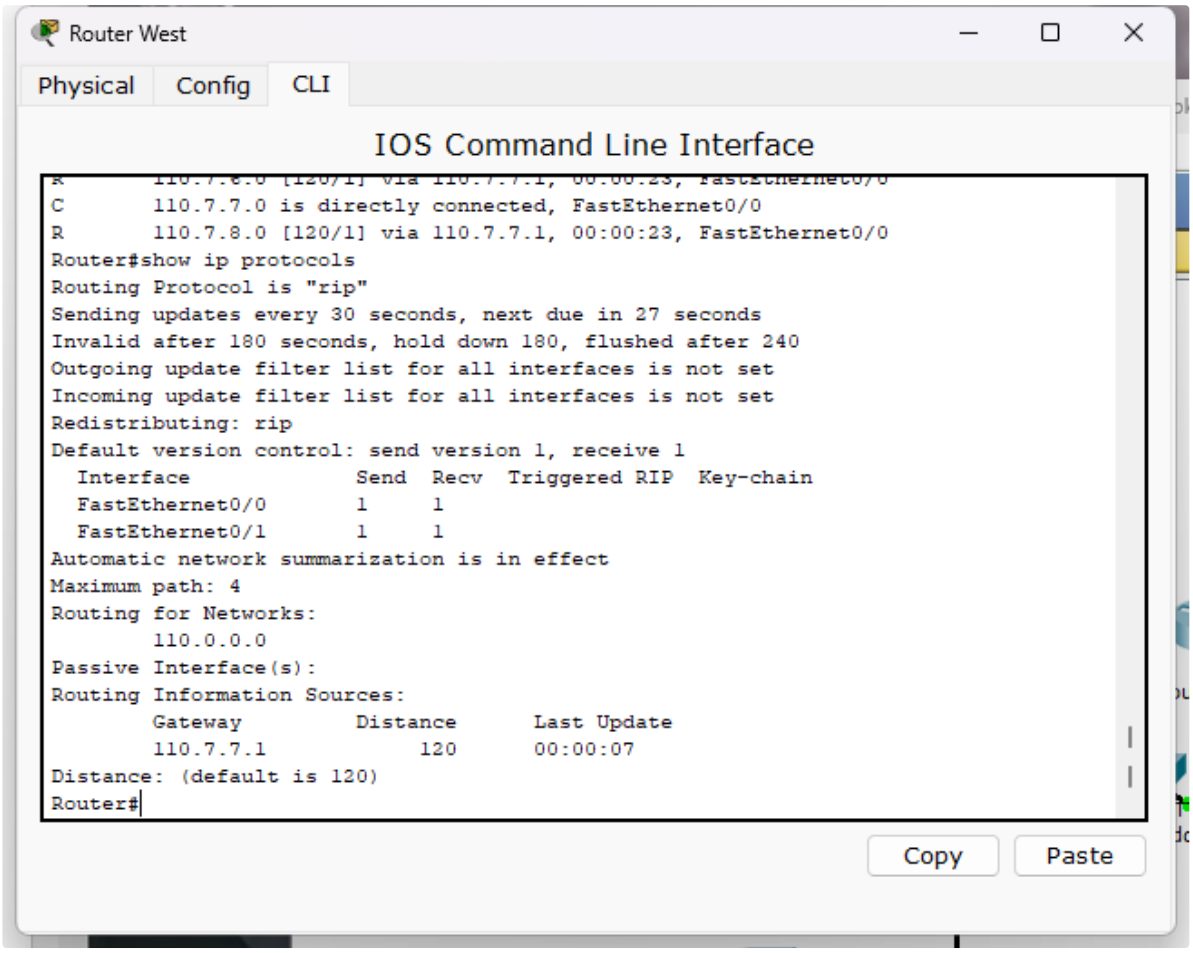
3. 东


Router East
Physical
Config
CLI
IOS Command Line Interface
R 110.7.7.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.5.1, 00:00:17, FastEthernet0/0
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 19 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive 1
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 1
FastEthernet0/1 1 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
110.0.0.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
110.7.5.1 120 00:00:08
Distance: (default is 120)
Router#
Copy
Paste

4. 南

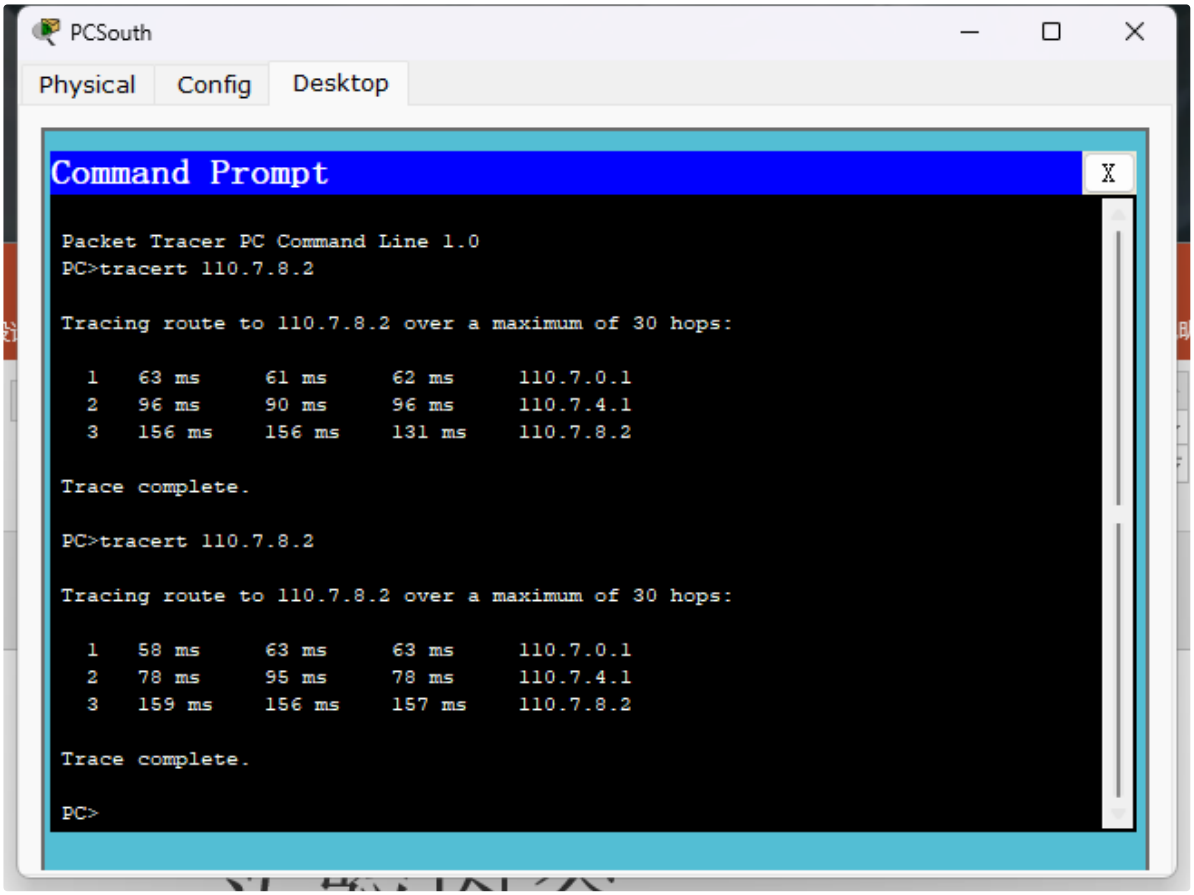

Router South
Physical
Config
CLI
IOS Command Line Interface
R 110.7.7.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.4.1, 00:00:04, FastEthernet0/0
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 2 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive 1
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 1
FastEthernet0/1 1 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
110.0.0.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
110.7.4.1 120 00:00:24
Distance: (default is 120)
Router#
Copy
Paste

5. 西

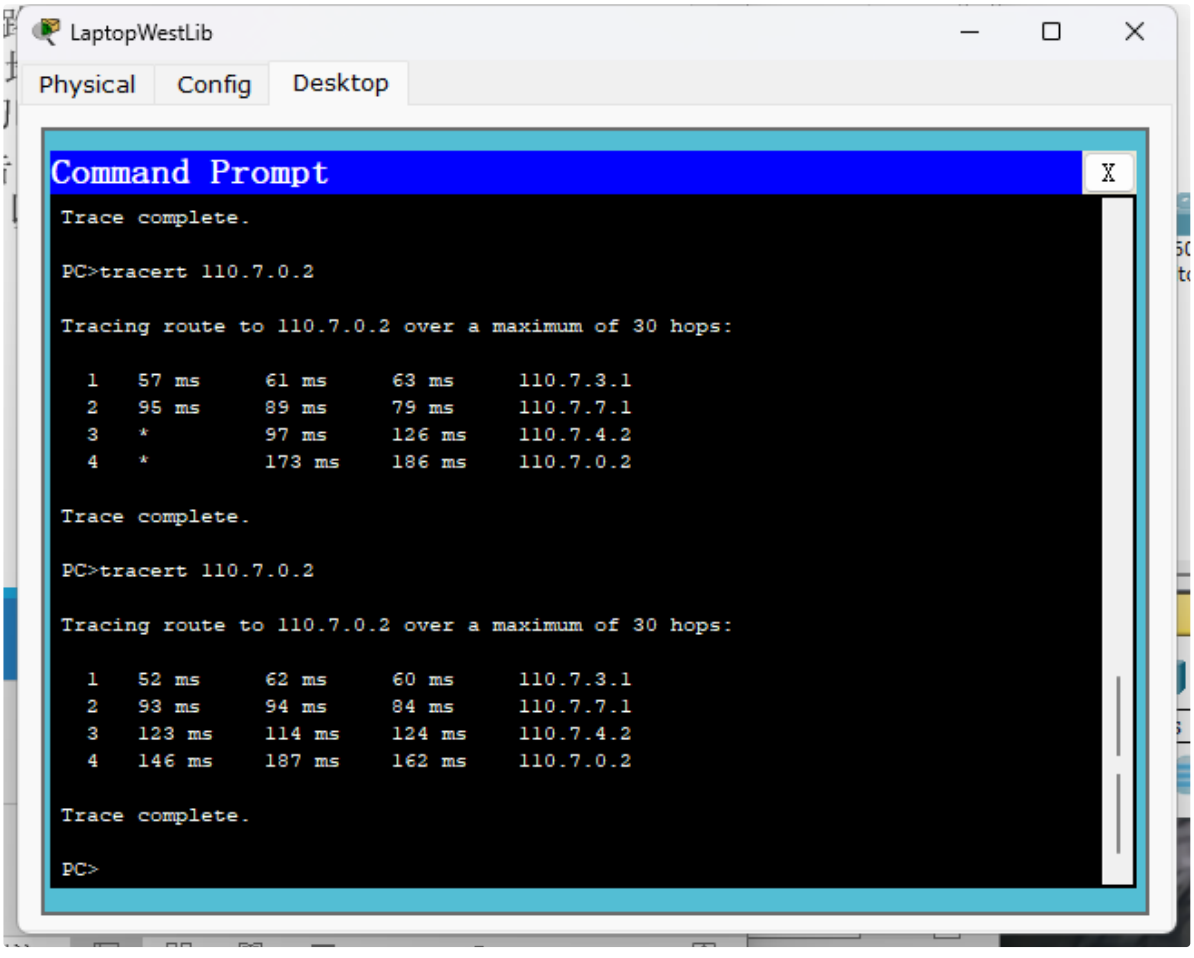

Router West
Physical
Config
CLI
IOS Command Line Interface
C 110.7.7.0 is directly connected, FastEthernet0/0
R 110.7.8.0 [120/1] via 110.7.7.1, 00:00:23, FastEthernet0/0
Router#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 27 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive 1
Interface Send Recv Triggered RIP Key-chain
FastEthernet0/0 1 1
FastEthernet0/1 1 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
110.0.0.0
Passive Interface(s):
Routing Information Sources:
Gateway Distance Last Update
110.7.7.1 120 00:00:07
Distance: (default is 120)
Router#
Copy
Paste

连通性测试：

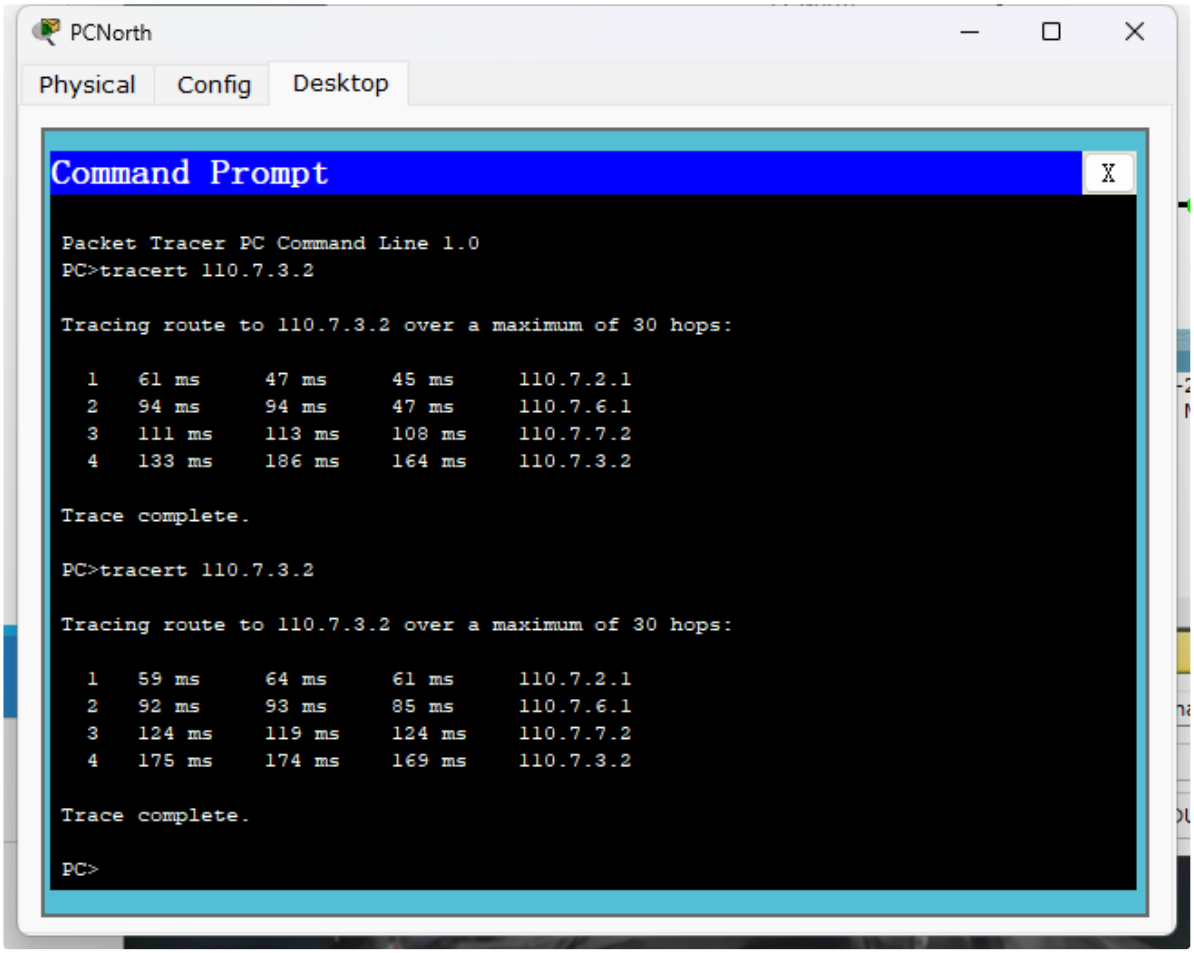
1. 南到中



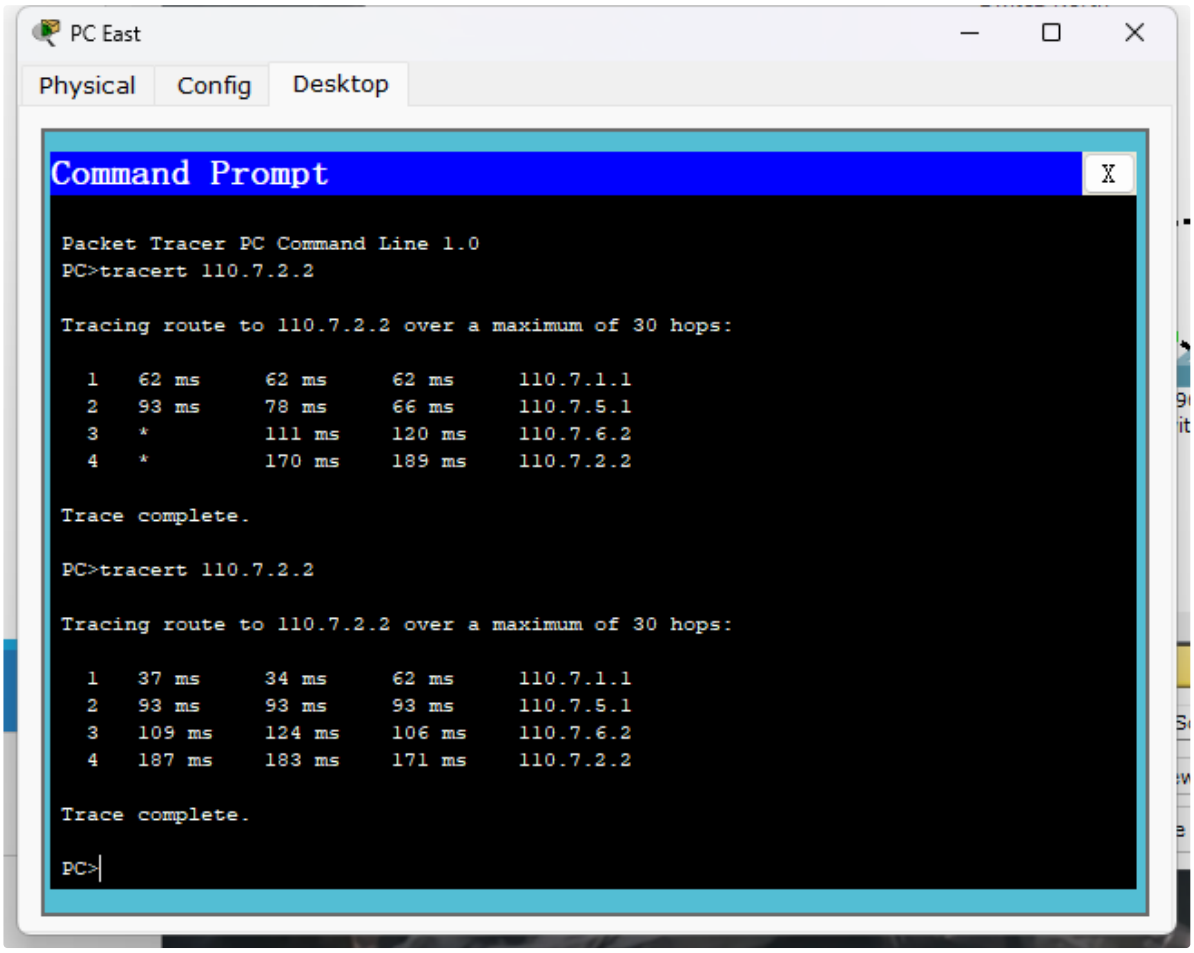
2. 西到南



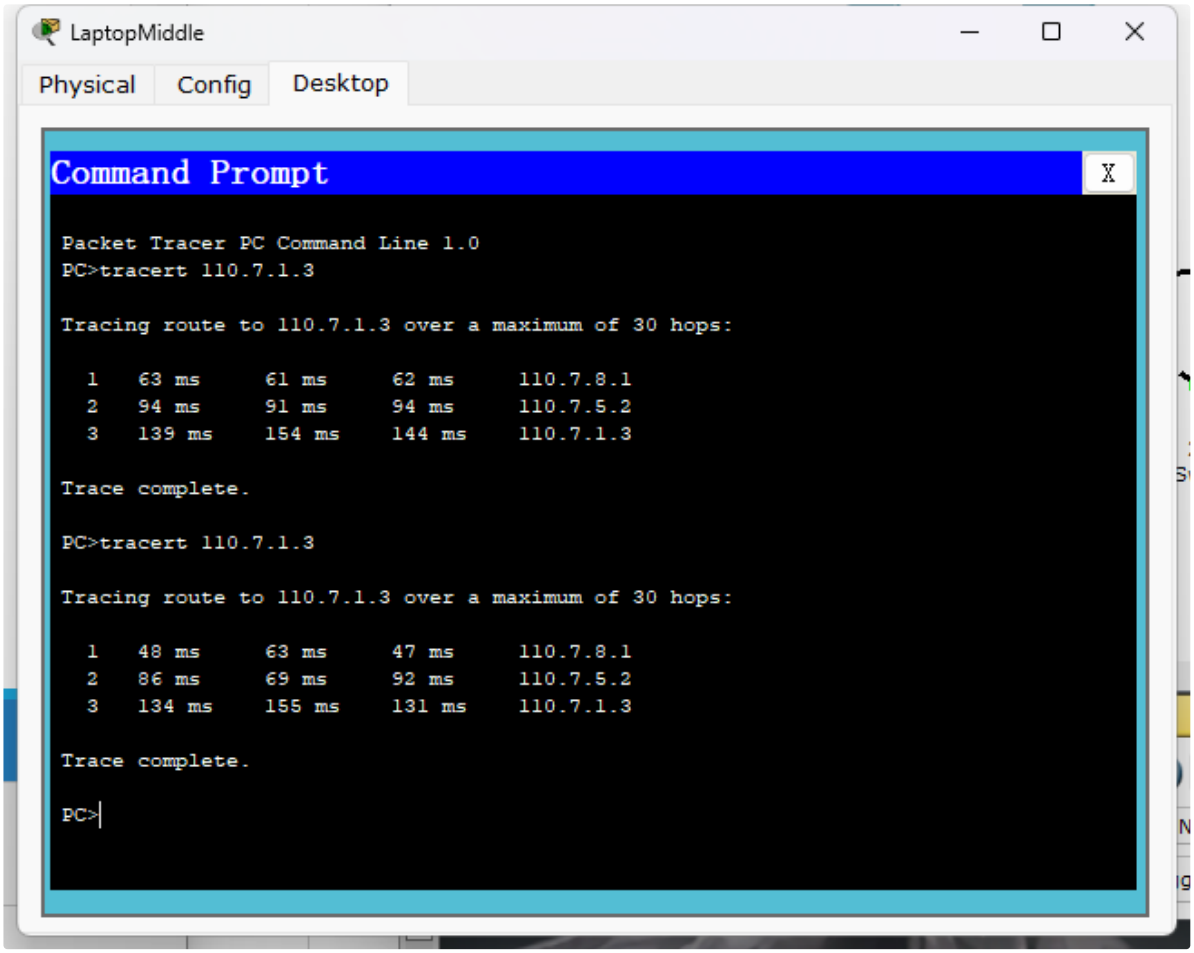
3. 北到西


PCNorth
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.3.2
Tracing route to 110.7.3.2 over a maximum of 30 hops:
1 61 ms 47 ms 45 ms 110.7.2.1
2 94 ms 94 ms 47 ms 110.7.6.1
3 111 ms 113 ms 108 ms 110.7.7.2
4 133 ms 186 ms 164 ms 110.7.3.2
Trace complete.
PC>tracert 110.7.3.2
Tracing route to 110.7.3.2 over a maximum of 30 hops:
1 59 ms 64 ms 61 ms 110.7.2.1
2 92 ms 93 ms 85 ms 110.7.6.1
3 124 ms 119 ms 124 ms 110.7.7.2
4 175 ms 174 ms 169 ms 110.7.3.2
Trace complete.
PC>

4. 东到北


PC East
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.2.2
Tracing route to 110.7.2.2 over a maximum of 30 hops:
1 62 ms 62 ms 62 ms 110.7.1.1
2 93 ms 78 ms 66 ms 110.7.5.1
3 * 111 ms 120 ms 110.7.6.2
4 * 170 ms 189 ms 110.7.2.2
Trace complete.
PC>tracert 110.7.2.2
Tracing route to 110.7.2.2 over a maximum of 30 hops:
1 37 ms 34 ms 62 ms 110.7.1.1
2 93 ms 93 ms 93 ms 110.7.5.1
3 109 ms 124 ms 106 ms 110.7.6.2
4 187 ms 183 ms 171 ms 110.7.2.2
Trace complete.
PC>

5. 中到东


LaptopMiddle
Physical
Config
Desktop
Command Prompt
Packet Tracer PC Command Line 1.0
PC>tracert 110.7.1.3
Tracing route to 110.7.1.3 over a maximum of 30 hops:
1 63 ms 61 ms 62 ms 110.7.8.1
2 94 ms 91 ms 94 ms 110.7.5.2
3 139 ms 154 ms 144 ms 110.7.1.3
Trace complete.
PC>tracert 110.7.1.3
Tracing route to 110.7.1.3 over a maximum of 30 hops:
1 48 ms 63 ms 47 ms 110.7.8.1
2 86 ms 69 ms 92 ms 110.7.5.2
3 134 ms 155 ms 131 ms 110.7.1.3
Trace complete.
PC>