

Data Communication and Computer Networks

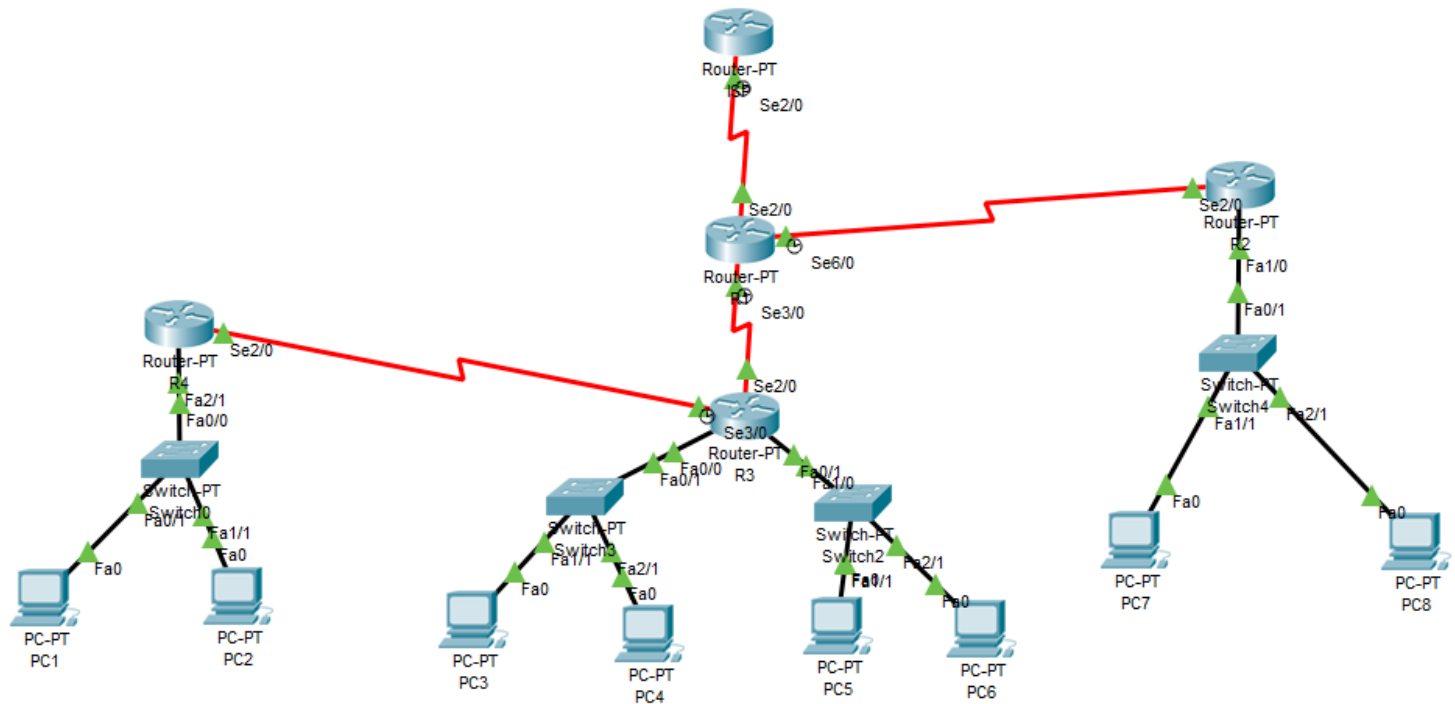
EEE314

Lab Terminal



| | |
|---------------------|----------------------|
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Topology after basic configuration:



Due to shortage of time only a few packet sent are shown.

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | E |
|------|-------------|--------|-------------|------|-------|-----------|----------|-----|---|
| | Successful | PC1 | PC2 | ICMP | | 0.000 | N | 0 | (|
| | Successful | PC1 | PC3 | ICMP | | 0.000 | N | 1 | (|

IP: 204.15.90.0/24

- **Net A (R&D) 14 employees:** requires a /28 (255.255.255.240) mask to support 14 hosts
- **Net B (S&M) 28 employees:** requires a /27 (255.255.255.224) mask to support 28 hosts
- **Net C (Admin) 7 employees:** requires a /28 (255.255.255.240) mask to support 7 hosts
- **Net D (Remote) 28 employees:** requires a /27 (255.255.255.224) mask to support 28host
- **Net E 2 hosts req:** requires a /30 (255.255.255.252) mask to support 2host
- **Net F 2 hosts req:** requires a /30 (255.255.255.252) mask to support 2host
- **Net G 2 hosts req:** requires a /30 (255.255.255.252) mask to support 2host
- **Net H 2 hosts req:** requires a /30 (255.255.255.252) mask to support 2host

| Network | Subnet | First host address | Last host address | Broadcast Address | Subnet |
|-----------|---------------|--------------------|-------------------|-------------------|-----------------|
| Network B | 204.15.90.0 | 204.15.90.1 | 204.15.90.30 | 204.15.90.31 | 255.255.255.224 |
| Network D | 204.15.90.32 | 204.15.90.33 | 204.15.90.62 | 204.15.90.63 | 255.255.255.224 |
| Network A | 204.15.90.64 | 204.15.90.65 | 204.15.90.78 | 204.15.90.79 | 255.255.255.240 |
| Network C | 204.15.90.80 | 204.15.90.81 | 204.15.90.94 | 204.15.90.95 | 255.255.255.240 |
| Network E | 204.15.90.96 | 204.15.90.97 | 204.15.90.98 | 204.15.90.99 | 255.255.255.252 |
| Network F | 204.15.90.100 | 204.15.90.101 | 204.15.90.102 | 204.15.90.103 | 255.255.255.252 |
| Network G | 204.15.90.104 | 204.15.90.105 | 204.15.90.106 | 204.15.90.107 | 255.255.255.252 |
| Network H | 204.15.90.108 | 204.15.90.109 | 204.15.90.110 | 204.15.90.111 | 255.255.255.252 |

Network E,F,G,H are for ips to be used between routers.

Now networks with most hosts will get ips first,

The rest of the ips will remain unused

Addressing table

| Device | Interface | Ip | Subnet Mask | Default Gateway |
|--------|------------------|---------------|-----------------|-----------------|
| ISP | Serial interface | 204.15.90.97 | 255.255.255.252 | N/A |
| R1 | Serial interface | 204.15.90.98 | 255.255.255.252 | N/A |
| | Serial interface | 204.15.90.101 | 255.255.255.252 | N/A |
| | Serial interface | 204.15.90.105 | 255.255.255.252 | N/A |
| R2 | Serial interface | 204.15.90.102 | 255.255.255.252 | N/A |
| | Fast Ethernet | 204.15.90.81 | 255.255.255.240 | N/A |
| R3 | Serial interface | 204.15.90.106 | 255.255.255.252 | N/A |
| | Serial interface | 204.15.90.109 | 255.255.255.252 | N/A |
| | Fast Ethernet | 204.15.90.1 | 255.255.255.224 | N/A |
| | Fast Ethernet | 204.15.90.65 | 255.255.255.240 | N/A |
| R4 | Serial interface | 204.15.90.110 | 255.255.255.252 | N/A |
| | Fast Ethernet | 204.15.90.33 | 255.255.255.224 | N/A |

| | | | | |
|------|-----|--------------|-----------------|--------------|
| PC 1 | N/A | 204.15.90.34 | 255.255.255.224 | 204.15.90.33 |
| PC 2 | N/A | 204.15.90.35 | 255.255.255.224 | 204.15.90.33 |
| PC 3 | N/A | 204.15.90.2 | 255.255.255.224 | 204.15.90.1 |
| PC 4 | N/A | 204.15.90.3 | 255.255.255.224 | 204.15.90.1 |
| PC 5 | N/A | 204.15.90.66 | 255.255.255.240 | 204.15.90.65 |
| PC 6 | N/A | 204.15.90.67 | 255.255.255.240 | 204.15.90.65 |
| PC 7 | N/A | 204.15.90.82 | 255.255.255.240 | 204.15.90.81 |
| PC 8 | N/A | 204.15.90.83 | 255.255.255.240 | 204.15.90.81 |

Router ISP:

Show ip route:

ISP>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

204.15.90.0/30 is subnetted, 1 subnets

C 204.15.90.96 is directly connected, Serial2/0

Show ip protocols:

ISP>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 204.15.90.97

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

204.16.90.96 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

Distance: (default is 110).

Show ip interface brief:

ISP#show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 unassigned YES unset administratively down down

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 204.15.90.97 YES manual up up

Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down

Router 1:

Show ip route:

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

204.15.90.0/30 is subnetted, 3 subnets

C 204.15.90.96 is directly connected, Serial2/0

C 204.15.90.100 is directly connected, Serial6/0

C 204.15.90.104 is directly connected, Serial3/0

Show ip protocols:

Router>show ip protocol

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 204.15.90.105

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

204.15.90.96 0.0.0.3 area 0

204.15.90.100 0.0.0.3 area 0

204.15.90.104 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

204.15.90.105 110 00:00:10

Distance: (default is 110)

Show ip interface brief:

Router>show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 unassigned YES unset administratively down down

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 204.15.90.98 YES manual up up

Serial3/0 204.15.90.105 YES manual up up

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

Serial6/0 204.15.90.101 YES manual up up

Router 2:

Show ip route:

R2>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

204.15.90.0/24 is variably subnetted, 2 subnets, 2 masks

C 204.15.90.80/28 is directly connected, FastEthernet1/0

C 204.15.90.100/30 is directly connected, Serial2/0

Show ip protocols:

R2#show ip protocol

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 204.15.90.102

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

204.15.90.100 0.0.0.3 area 0

204.15.90.80 0.0.0.15 area 0

Routing Information Sources:

Gateway Distance Last Update

204.15.90.102 110 00:00:10

204.15.90.105 110 00:00:24

Distance: (default is 110)**Show ip interface brief:**

R2>show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 unassigned YES manual administratively down down

FastEthernet1/0 204.15.90.81 YES manual up up

Serial2/0 204.15.90.102 YES manual up up

Serial3/0 unassigned YES unset administratively down down

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

Router 3:

Show ip route:

R3>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

204.15.90.0/24 is variably subnetted, 4 subnets, 2 masks
C 204.15.90.0/27 is directly connected, FastEthernet0/0
C 204.15.90.64/27 is directly connected, FastEthernet1/0
C 204.15.90.104/30 is directly connected, Serial2/0
C 204.15.90.108/30 is directly connected, Serial3/0

Show ip protocols:

R3>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 204.15.90.109
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
204.15.90.104 0.0.0.3 area 0
204.15.90.108 0.0.0.3 area 0
204.15.90.0 0.0.0.31 area 0
204.15.90.64 0.0.0.15 area 0
Routing Information Sources:
Gateway Distance Last Update
204.15.90.102 110 00:01:32
204.15.90.105 110 00:00:31
204.15.90.109 110 00:00:06
Distance: (default is 110)

Show ip interface brief:

R3>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 204.15.90.1 YES manual up up
FastEthernet1/0 204.15.90.65 YES manual up up
Serial2/0 204.15.90.106 YES manual up up
Serial3/0 204.15.90.109 YES manual up up
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down

Router 4:

Show ip route:

R4r>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

204.15.90.0/24 is variably subnetted, 2 subnets, 2 masks

C 204.15.90.32/27 is directly connected, FastEthernet0/0

C 204.15.90.108/30 is directly connected, Serial2/0

Show ip protocols:

R4r>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 204.15.90.110

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

204.15.90.108 0.0.0.3 area 0
204.15.90.32 0.0.0.31 area 0
Routing Information Sources:
Gateway Distance Last Update
204.15.90.102 110 00:02:38
204.15.90.105 110 00:01:37
204.15.90.109 110 00:00:17
204.15.90.110 110 00:00:07
Distance: (default is 110)

Show ip interface brief:

R4r>show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 204.15.90.33 YES manual up up
FastEthernet1/0 unassigned YES unset administratively down down
Serial2/0 204.15.90.110 YES manual up up
Serial3/0 unassigned YES unset administratively down down
FastEthernet4/0 unassigned YES unset administratively down down
FastEthernet5/0 unassigned YES unset administratively down down