For implementing the project, At first I designed the model. Then I set network to two parts - public,private. Then I named the LAN, WAN and hosts. After that I set Ip, sub of each network and hosts both manually and dhcp. I fulfilled all number of device requirements. Then I used rip+ospf routing and at last I applied static nat.

**IOS Commands:**

All router manual configuration:

**R1:**

Router>en

Router#config t

Router(config)#int gig0/0/0

Router(config-if)#ip address 192.168.10.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int gig0/0/1

Router(config-if)#ip address 192.168.20.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int Se0/1/1

Router(config-if)#ip address 10.1.1.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#ex

Router#wr

**R2:**

Router>en

Router#config t

Router(config)#int gig0/0/1

Router(config-if)#ip address 192.168.30.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int gig0/0/0

Router(config-if)#ip address 192.168.40.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int Se0/1/0

Router(config-if)#ip address 10.1.2.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#ex

Router#wr

**R3:**

Router#config t

Router(config)#int Se0/1/1

Router(config-if)#ip address 10.1.1.2 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int se0/1/0

Router(config-if)#ip address 10.2.1.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int se0/2/0

Router(config-if)#ip address 10.1.2.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#ex

Router#wr

**R4:**

Router>en

Router#config t

Router(config)#int gig0/0/0

Router(config-if)#ip address 192.168.50.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int gig0/0/1

Router(config-if)#ip address 192.168.60.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int se0/1/1

Router(config-if)#ip address 192.168.1.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#ex

Router#wr

**R5:**

Router>en

Router#config t

Router(config)#int gig0/0/1

Router(config-if)#ip address 192.168.70.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int gig0/0/0

Router(config-if)#ip address 192.168.80.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int se0/1/0

Router(config-if)#ip address 192.168.2.1 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#ex

Router#wr

**R6:**

Router>en

Router#config t

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

Router(config)#int se0/1/1

Router(config-if)#ip address 192.168.1.2 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config)#int se0/2/0

Router(config-if)#ip address 192.168.2.2 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#no shutdown

Router(config-if)#ex

Router(config)#int se0/1/0

Router(config-if)#ip address 10.2.1.2 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#bandwidth 64

Router(config-if)#ex

Router(config)#ex

Router#wr

**DHCP Configuration:**

**R1:**

Router>en

Router#config t

Router(config)#ip dhcp pool LAN-1

Router(dhcp-config)#network 192.168.10.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.10.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool LAN-2

Router(dhcp-config)#network 192.168.20.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.20.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-1

Router(dhcp-config)#network 10.1.1.0 255.255.255.252

Router(dhcp-config)#default-router 10.1.1.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#wr

**R2:**

Router>en

Router#config t

Router(config)#ip dhcp pool LAN-3

Router(dhcp-config)#network 192.168.30.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.30.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool LAN-4

Router(dhcp-config)#network 192.168.40.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.40.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-2

Router(dhcp-config)#network 10.10.2.0 255.255.255.252

Router(dhcp-config)#default-router 10.10.2.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#wr

**R3:**

Router>en

Router#config t

Router(config)#ip dhcp pool WAN-1

Router(dhcp-config)#network 10.1.1.0 255.255.255.252

Router(dhcp-config)#default-router 10.1.1.2

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-2

Router(dhcp-config)#network 10.1.2.0 255.255.255.252

Router(dhcp-config)#default-router 10.1.2.2

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-5

Router(dhcp-config)#network 10.2.1.0 255.255.255.252

Router(dhcp-config)#default-router 10.2.1.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#

wr

**R4:**

Router>en

Router#config t

Router(config)#ip dhcp pool LAN-5

Router(dhcp-config)#network 192.168.50.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.50.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool LAN-6

Router(dhcp-config)#network 192.168.60.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.60.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-3

Router(dhcp-config)#network 192.168.1.0 255.255.255.252

Router(dhcp-config)#default-router 192.168.1.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#wr

**R5:**

Router>en

Router#config t

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

Router(config)#ip dhcp pool LAN-7

Router(dhcp-config)#network 192.168.70.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.70.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool LAN-8

Router(dhcp-config)#network 192.168.80.0 255.255.255.0

Router(dhcp-config)#default-router 192.168.80.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-4

Router(dhcp-config)#network 192.168.2.0 255.255.255.252

Router(dhcp-config)#default-router 192.168.2.1

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

Router#

**R6:**

Router>en

Router#config t

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

Router(config)#ip dhcp pool WAN-3

Router(dhcp-config)#network 192.168.1.0 255.255.255.252

Router(dhcp-config)#default-router 192.168.1.2

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-4

Router(dhcp-config)#network 192.168.2.0 255.255.255.252

Router(dhcp-config)#default-router 192.168.2.2

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ip dhcp pool WAN-5

Router(dhcp-config)#network 10.2.1.0 255.255.255.252

Router(dhcp-config)#default-router 10.2.1.2

Router(dhcp-config)#dns-server 8.8.8.8

Router(dhcp-config)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**Dynamic Routing configuration:**

**R1:**

Router>en

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 192.168.10.0

Router(config-router)#network 192.168.20.0

Router(config-router)#network 10.1.1.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R1:**

Router>en

Router#config t

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

Router(config)#router ospf 10

Router(config-router)#router-id 1.1.1.1

Router(config-router)#network 192.168.10.0 0.0.0.255 area 0

Router(config-router)#network 192.168.20.0 0.0.0.255 area 0

Router(config-router)#network 10.1.1.0 0.0.0.3 area 0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R2:**

Router>en

Router#config t

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

Router(config)#router ospf 10

Router(config-router)#router-id 1.1.1.1

Router(config-router)#network 192.168.30.0 0.0.0.255 area 0

Router(config-router)#network 192.168.40.0 0.0.0.255 area 0

Router(config-router)#network 10.1.2.0 0.0.0.3 area 0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R2:**

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 10.1.2.0

Router(config-router)#network 192.168.30.0

Router(config-router)#network 192.168.40.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R3:**

Router>en

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 10.1.1.0

Router(config-router)#network 10.1.2.0

Router(config-router)#network 10.2.1.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R3:**

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 10.1.1.0

Router(config-router)#network 10.1.2.0

Router(config-router)#network 10.2.1.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R4:**

Router>en

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 192.168.50.0

Router(config-router)#network 192.168.60.0

Router(config-router)#network 192.168.1.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R4:**

Router>en

Router#config t

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

Router(config)#router ospf 10

Router(config-router)#router-id 1.1.1.1

Router(config-router)#network 192.168.50.0 0.0.0.255 area 0

Router(config-router)#network 192.168.60.0 0.0.0.255 area 0

Router(config-router)#network 192.168.1.0 0.0.0.3 area 0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R5:**

Router>en

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 192.168.70.0

Router(config-router)#network 192.168.80.0

Router(config-router)#network 192.168.2.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

Router>en

Router#config t

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

Router(config)#router ospf 10

Router(config-router)#router-id 1.1.1.1

Router(config-router)#network 192.168.70.0 0.0.0.255 area 0

Router(config-router)#network 192.168.80.0 0.0.0.255 area 0

Router(config-router)#network 192.168.2.0 0.0.0.3 area 0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R6:**

Router>en

Router#config t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#network 10.2.1.0

Router(config-router)#network 192.168.1.0

Router(config-router)#network 192.168.2.0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**R6:**

Router>en

Router#config t

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

Router(config)#router ospf 10

Router(config-router)#router-id 1.1.1.1

Router(config-router)#network 192.168.1.0 0.0.0.3 area 0

Router(config-router)#network 192.168.2.0 0.0.0.3 area 0

Router(config-router)#network 10.2.1.0 0.0.0.3 area 0

Router(config-router)#ex

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**Set NAT static:**

**R1:**

Router>en

Router#config t

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

Router(config)#int se0/1/1

Router(config-if)#ip nat inside

Router(config-if)#ex

Router(config)#int se0/2/0

Router(config-if)#ip nat inside

Router(config-if)#ex

Router(config)#int se0/1/0

Router(config-if)#ip nat outside

Router(config-if)#ex

Router(config)#ip nat inside source static 192.168.1.1 10.1.1.2

Router(config)#ex

Router#

%SYS-5-CONFIG\_I: Configured from console by console

wr

Building configuration...

[OK]

**Challenges:**

1. I set some network with RIP, and some With OSPF at first and it was conflicting when sending ping. Set both RIP and OSPF fix this problem.