National College of Ireland

Configuration Manual

MSc Research Project
Secure Network Design and Implementation Using MPLS VPN

Mayur Mungse
Student ID: X21118823

School of Computing
National College of Ireland

Supervisor: Prof. Imran Khan

National College of Ireland

MSc Project Submission Sheet

School of Computing

Student Name:	Mr. Mayur Mohan Mungse
Student ID:	X21188823
Programme:	Master's Cybersecurity **Year:** 2023-24
Module:	Research project
Lecturer:	Prof. Imran Khan
Submission Due Date:	14th December 2023
Project Title:	Secure Network Design and Implementation Using MPLS VPN
Word Count:	**753 Page Count: 7**

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Configuration Manual

Mayur Mohan Mungse
Student ID: X21188823

1 Basic interface configuration of routers

R1

```
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip add 10.1.2.1 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int f0/1
R1(config-if)#ip add 10.1.4.2 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int f1/0
R1(config-if)#ip add 10.1.5.2 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int f1/1
R1(config-if)#ip add 10.1.6.2 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int lo0
R1(config-if)#ip add 1.1.1.1 255.255.255.255
```

R2

```
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int f0/0
R2(config-if)#ip add 10.1.2.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int f0/1
R2(config-if)#ip add 10.2.3.1 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int lo0
R2(config-if)#ip add 2.2.2.2 255.255.255.255
```

R3

```
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#int f0/0
R3(config-if)#ip add 10.2.3.2 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int f0/1
R3(config-if)#ip add 10.3.7.1 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int f1/0
R3(config-if)#ip add 10.3.8.1 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int f1/1
R3(config-if)#ip add 10.3.9.1 255.255.255.252
```

```
R3(config-if)#no shut
R3(config-if)#int lo0
R3(config-if)#ip add 3.3.3.3 255.255.255.255
```

R4

```
R4#config t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#int f0/0
R4(config-if)#ip add 10.1.4.1 255.255.255.252
R4(config-if)#no shut
R4(config-if)#int lo0
R4(config-if)#ip add 4.4.4.4 255.255.255.255
R4(config-if)#no shut
```

R5

```
R5#config t
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#int f0/0
R5(config-if)#ip add 10.1.5.1 255.255.255.252
R5(config-if)#no shut
R5(config-if)#int lo0
R5(config-if)#ip add 5.5.5.5 255.255.255.255
```

R6

```
R6#config t
Enter configuration commands, one per line. End with CNTL/Z.
R6(config)#int f0/0
R6(config-if)#ip add 10.1.6.1 255.255.255.252
R6(config-if)#no shut
R6(config-if)#int lo0
R6(config-if)#ip add 6.6.6.6 255.255.255.255
```

R7

```
R7#config t
Enter configuration commands, one per line. End with CNTL/Z.
R7(config)#int f0/0
R7(config-if)#ip add 10.3.7.2 255.255.255.252
R7(config-if)#no shut
R7(config-if)#int lo0
R7(config-if)#ip add 7.7.7.7 255.255.255.255
```

R8

```
R8#config t
Enter configuration commands, one per line. End with CNTL/Z.
R8(config)#int f0/0
R8(config-if)#ip add 10.3.8.2 255.255.255.252
R8(config-if)#no shut
R8(config-if)#int lo0
R8(config-if)#ip add 8.8.8.8 255.255.255.255
```

R9

R9#config t
Enter configuration commands, one per line. End with CNTL/Z.
R9(config)#int f0/0
R9(config-if)#ip add 10.3.9.2 255.255.255.252
R9(config-if)#no shut
R9(config-if)#int lo0
R9(config-if)#ip add 9.9.9.9 255.255.255.255

2 OSPF configuration on edge routers

R1

Router OSPF 1
Network 10.1.0.0 0.0.255.255 area 0
Network 1.1.1.1 0.0.0.0 area0

R2

Network 10.0.0.0 0.255.255.255 area0
Network 2.2.2.2 0.0.0.0 area 0

R3

Router ospf 1
Network 10.0.0.0 0.255.255.255 area 0
Network 3.3.3.3 0.0.0.0 area 0

3 MPLS configuration of edge routers

R1

Mpls label protocol ldp
Mpls ldp router id lo0
Int f0/0
Mpls ip

R2

Mpls label protocol ldp
Mpls ldp router id lo0
Int ra f0/0 – 1
Mpls ip

R3

Mpls label protocol ldp
Mpls ldp router id lo0
Int f0/1
Mpls ip

4 Create VRF for separate connection

R1

Ip vrf A1
RD65000:100
Router-target import 65000:100
Router-target export 65000:100
Router-target import 65000:200
Router-target export 65000:200
Router-target import 65000:300
Router-target export 65000:300

Ip vrf B1
RD65000:200
Router-target import 65000:200
Router-target export 65000:200

Ip vrf C1
RD65000:300
Router-target import 65000:300
Router-target export 65000:300
Router-target import 65000:200
Router-target export 65000:200

R2

Ip vrf A2
RD65000:100
Router-target import 65000:100
Router-target export 65000:100
Router-target import 65000:200
Router-target export 65000:200
Router-target import 65000:300
Router-target export 65000:300

Ip vrf B2
RD65000:200
Router-target import 65000:200
Router-target export 65000:200

Ip vrf C2
RD65000:300
Router-target import 65000:300

Router-target export 65000:300
Router-target import 65000:200
Router-target export 65000:200

5 VRF Forwarding config

R1

Int f0/1
Ip forwarding A1
Ip address 10.1.4.2 255.255.255.252
No shut

Int f1/0
Ip forwarding B1
Ip address 10.1.5.2 255.255.255.252
No shut

Int f1/1
Ip forwarding C1
Ip address 10.1.6.2 255.255.255.252
No shut

R3

Int f0/1
Ip forwarding A1
Ip address 10.3.7.1 255.255.255.252
No shut

Int f1/0
Ip forwarding B1
Ip address 10.3.8.1 255.255.255.252
No shut

Int f1/1
Ip forwarding C1
Ip address 10.3.9.1 255.255.255.252
No shut

6 Static default Route toward PE routers

R4

Ip route 0.0.0.0 0.0.0.0 10.1.4.2

R5

Ip route 0.0.0.0 0.0.0.0 10.1.5.2

R6

Ip route 0.0.0.0 0.0.0.0 10.1.6.2

R7

Ip route 0.0.0.0 0.0.0.0 10.3.7.1

R8

Ip route 0.0.0.0 0.0.0.0 10.3.8.1

R9

Ip route 0.0.0.0 0.0.0.0 10.3.9.1

R1

Ip route vrf A1 4.4.4.4 255.255.255.255 10.1.4.1
Ip route vrf B1 5.5.5.5 255.255.255.255 10.1.5.1
Ip route vrf C1 6.6.6.6 255.255.255.255 10.1.6.1

R2

Ip route vrf A2 7.7.7.7 255.255.255.255 10.3.7.2
Ip route vrf B2 8.8.8.8 255.255.255.255 10.3.8.2
Ip route vrf C2 9.9.9.9 255.255.255.255 10.3.9.2

7 BGP configuration

R1

Router BGP 65000
Neigbhour 3.3.3.3 remote-as 65000
Neigbhour 3.3.3.3 update-source lo0

Address-family vpnv4
Neigbhour 3.3.3.3 activate
Neigbhour 3.3.3.3 next hop-self
Neigbhour 3.3.3.3 send-community

Address-family ipv4 VRF A1
Redistribute static
Redistribute connected

Address-family Ipv4 vrf B1
Redistribute static
Redistribute connected

Address-family ipv4 VRF C1
Redistribute static
Redistribute connected

R2

Router BGP 65000
Neigbhour 1.1.1.1 remote-as 65000
Neigbhour 1.1.1.1 update-source lo0

Address-family vpnv4
Neigbhour 1.1.1.1 activate
Neigbhour 1.1.1.1 next hop-self
Neigbhour 1.1.1.1 send-community

Address-family ipv4 VRF A1
Redistribute static
Redistribute connected

Address-family Ipv4 vrf B1
Redistribute static
Redistribute connected

Address-family ipv4 VRF C1
Redistribute static
Redistribute connected