

# Network Topology and FortiGate Configuration Documentation

## 1. Introduction

This document provides a full academic-style explanation of the designed clinic network, including topology description, VLAN segmentation, routing configuration, FortiGate security policies, and overall traffic flow.

## 2. Network Topology Overview

The topology consists of multilayer switches (MLS1, MLS2), routers (R1, R2, R3), access switches, and a FortiGate firewall. VMnet8 is used for internet NAT, mapped to GNS3 Cloud.

## 3. VLAN Segmentation

Department	VLAN	Subnet
Managers	20	192.168.20.0/24
Doctors	21	192.168.21.0/24
Reception	22	192.168.22.0/24

## 4. MLS Configuration Summary

- VLANs 20/21/22 created
- SVI interfaces configured with gateway IPs
- DHCP pools created for each VLAN
- Default route pointing to FortiGate port2

## 5. Router Configuration Summary

- R1/R2/R3 configured to forward traffic between internal subnets
- Static routes applied between routers

## 6. FortiGate Configuration

### 6.1 Interfaces

Interface	Role	IP Address
port1	WAN	192.168.45.10/24
port2	LAN	10.0.3.1/24
port3	Router	10.0.4.1/24

## 6.2 Firewall Policies

- Managers -> Internet (Allow, low restriction)
- Doctors -> Internet (Medium filtering)
- Reception -> Internet (Strict filtering + app control)

## 6.3 Security Profiles

- AV: Clinic\_AV
- Web Filters: Manager\_WebFilter, Doctor\_WebFilter, Reception\_WebFilter
- App Control: Manager\_AppCtrl, Doctor\_AppCtrl, Reception\_AppCtrl

## 7. VMnet8 Internet Connectivity

VMnet8 provides NAT internet. FortiGate uses 192.168.45.1 as the gateway.

## 8. Static Routing

FortiGate Default Route: 0.0.0.0/0 → 192.168.45.1

MLS Default Route: 0.0.0.0/0 → 10.0.3.1

## 9. Conclusion

The configuration provides a real clinic-like secure network with segmentation, firewall control, and internet filtering through FortiGate.

All configurations

```
hostname R1
```

```
no ip domain-lookup
```

```
interface f0/0
```

```
description Link to R2
```

```
ip address 10.0.12.1 255.255.255.252
```

```
no shutdown
```

```
interface f1/0
```

```
description Link to R3
```

```
ip address 10.0.13.1 255.255.255.252
```

no shutdown

ip route 192.168.10.0 255.255.255.0 10.0.12.2

ip route 192.168.11.0 255.255.255.0 10.0.12.2

ip route 192.168.12.0 255.255.255.0 10.0.12.2

ip route 192.168.20.0 255.255.255.0 10.0.13.2

ip route 192.168.21.0 255.255.255.0 10.0.13.2

ip route 192.168.22.0 255.255.255.0 10.0.13.2

ip route 0.0.0.0 0.0.0.0 10.0.13.2

end

wr

--

hostname R2

no ip domain-lookup

interface f0/0

description Link to R1

ip address 10.0.12.2 255.255.255.252

no shutdown

interface f2/0

description Link to MLS2

ip address 10.0.2.1 255.255.255.252

no shutdown

```
ip route 192.168.10.0 255.255.255.0 10.0.2.2
ip route 192.168.11.0 255.255.255.0 10.0.2.2
ip route 192.168.12.0 255.255.255.0 10.0.2.2
ip route 0.0.0.0 0.0.0.0 10.0.12.1
```

```
end
```

```
wr
```

---

```
hostname R3
no ip domain-lookup
```

```
interface f0/0
description Link to R1
ip address 10.0.13.2 255.255.255.252
no shutdown
```

```
interface f1/0
description Link to Forti port3
ip address 10.0.3.1 255.255.255.252
no shutdown
```

```
ip route 192.168.10.0 255.255.255.0 10.0.13.1
ip route 192.168.11.0 255.255.255.0 10.0.13.1
ip route 192.168.12.0 255.255.255.0 10.0.13.1
ip route 192.168.20.0 255.255.255.0 10.0.3.2
```

```
ip route 192.168.21.0 255.255.255.0 10.0.3.2
```

```
ip route 192.168.22.0 255.255.255.0 10.0.3.2
```

```
ip route 0.0.0.0 0.0.0.0 10.0.3.2
```

```
end
```

```
wr
```

---

```
hostname MLS2
```

```
no ip domain-lookup
```

```
ip routing
```

```
! VLANs
```

```
vlan 10
```

```
name VLAN10_LEFT
```

```
vlan 11
```

```
name VLAN11_LEFT
```

```
vlan 12
```

```
name VLAN12_LEFT
```

```
! SVIs (Gateways)
```

```
interface vlan 10
```

```
ip address 192.168.10.1 255.255.255.0
```

```
no shutdown
```

```
interface vlan 11
```

```
ip address 192.168.11.1 255.255.255.0
```

```
no shutdown
```

```
interface vlan 12
```

ip address 192.168.12.1 255.255.255.0

no shutdown

! Routed link to R2

interface e0/2

no switchport

ip address 10.0.2.2 255.255.255.252

no shutdown

! Trunks to SW4

interface range e0/0 - 1

description Uplinks to SW4

switchport mode trunk

switchport trunk allowed vlan 10,11,12

no shutdown

! DHCP for VLAN10/11/12

ip dhcp excluded-address 192.168.10.1 192.168.10.20

ip dhcp excluded-address 192.168.11.1 192.168.11.20

ip dhcp excluded-address 192.168.12.1 192.168.12.20

ip dhcp pool VLAN10\_POOL

network 192.168.10.0 255.255.255.0

default-router 192.168.10.1

dns-server 8.8.8.8

```
ip dhcp pool VLAN11_POOL
network 192.168.11.0 255.255.255.0
default-router 192.168.11.1
dns-server 8.8.8.8
```

```
ip dhcp pool VLAN12_POOL
network 192.168.12.0 255.255.255.0
default-router 192.168.12.1
dns-server 8.8.8.8
```

! Default route towards the rest of the network

```
ip route 0.0.0.0 0.0.0.0 10.0.2.1
```

```
end
```

```
wr
```

---

```
hostname MLS2
```

```
no ip domain-lookup
```

```
ip routing
```

! VLANs

```
vlan 10
```

```
name VLAN10_LEFT
```

```
vlan 11
```

```
name VLAN11_LEFT
```

```
vlan 12
```

```
name VLAN12_LEFT
```

! SVIs (Gateways)

interface vlan 10

ip address 192.168.10.1 255.255.255.0

no shutdown

interface vlan 11

ip address 192.168.11.1 255.255.255.0

no shutdown

interface vlan 12

ip address 192.168.12.1 255.255.255.0

no shutdown

! Routed link to R2

interface e0/2

no switchport

ip address 10.0.2.2 255.255.255.252

no shutdown

! Trunks to SW4

interface range e0/0 - 1

description Uplinks to SW4

switchport mode trunk

switchport trunk allowed vlan 10,11,12

no shutdown

! DHCP for VLAN10/11/12



ip dhcp excluded-address 192.168.10.1 192.168.10.20

ip dhcp excluded-address 192.168.11.1 192.168.11.20

ip dhcp excluded-address 192.168.12.1 192.168.12.20

ip dhcp pool VLAN10\_POOL

network 192.168.10.0 255.255.255.0

default-router 192.168.10.1

dns-server 8.8.8.8

ip dhcp pool VLAN11\_POOL

network 192.168.11.0 255.255.255.0

default-router 192.168.11.1

dns-server 8.8.8.8

ip dhcp pool VLAN12\_POOL

network 192.168.12.0 255.255.255.0

default-router 192.168.12.1

dns-server 8.8.8.8

! Default route towards the rest of the network

ip route 0.0.0.0 0.0.0.0 10.0.2.1

end

wr

---

hostname SW4

no ip domain-lookup

vlan 10

name VLAN10\_LEFT

vlan 11

name VLAN11\_LEFT

vlan 12

name VLAN12\_LEFT

! Trunks to MLS2

interface range e0/0 - 1

switchport mode trunk

switchport trunk allowed vlan 10,11,12

no shutdown

! Trunks to SW5 & SW6

interface e1/0

switchport mode trunk

switchport trunk allowed vlan 10,11,12

no shutdown

interface e1/1

switchport mode trunk

switchport trunk allowed vlan 10,11,12

no shutdown

! Access ports for VLAN10 (PC1, PC2)

interface e0/2

switchport mode access

switchport access vlan 10

no shutdown

interface e0/3

switchport mode access

switchport access vlan 10

no shutdown

end

wr

---

hostname SW5

no ip domain-lookup

vlan 10

name VLAN10\_LEFT

vlan 11

name VLAN11\_LEFT

vlan 12

name VLAN12\_LEFT

! Trunks

interface e1/0

description To SW4

```
switchport mode trunk
switchport trunk allowed vlan 10,11,12
no shutdown
```

```
interface e1/1
description To SW6
switchport mode trunk
switchport trunk allowed vlan 10,11,12
no shutdown
```

```
! Access ports VLAN11 (PC3, PC5)
```

```
interface e0/2
switchport mode access
switchport access vlan 11
no shutdown
```

```
interface e0/3
switchport mode access
switchport access vlan 11
no shutdown
```

```
end
```

```
wr
```

---

```
hostname SW6
```

```
no ip domain-lookup
```

```
vlan 10
```

```
name VLAN10_LEFT
```

```
vlan 11
```

```
name VLAN11_LEFT
```

```
vlan 12
```

```
name VLAN12_LEFT
```

```
! Trunks
```

```
interface e1/0
```

```
description To SW5
```

```
switchport mode trunk
```

```
switchport trunk allowed vlan 10,11,12
```

```
no shutdown
```

```
interface e1/1
```

```
description To SW4
```

```
switchport mode trunk
```

```
switchport trunk allowed vlan 10,11,12
```

```
no shutdown
```

```
! Access ports VLAN12 (PC6, PC4)
```

```
interface e0/2
```

```
switchport mode access
```

```
switchport access vlan 12
```

no shutdown

interface e0/3

switchport mode access

switchport access vlan 12

no shutdown

end

wr

---

hostname MLS1

no ip domain-lookup

ip routing

! VLANs

vlan 20

name VLAN20\_RIGHT

vlan 21

name VLAN21\_RIGHT

vlan 22

name VLAN22\_RIGHT

! SVIs (Gateways)

interface vlan 20

ip address 192.168.20.1 255.255.255.0

no shutdown

interface vlan 21

ip address 192.168.21.1 255.255.255.0

no shutdown

interface vlan 22

ip address 192.168.22.1 255.255.255.0

no shutdown

! Routed link to Forti (port2)

interface e0/2

no switchport

ip address 10.0.4.2 255.255.255.252

no shutdown

! Trunks to SW1

interface range e0/0 - 1

description Uplinks to SW1

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

! DHCP for VLAN20/21/22

ip dhcp excluded-address 192.168.20.1 192.168.20.20

ip dhcp excluded-address 192.168.21.1 192.168.21.20

ip dhcp excluded-address 192.168.22.1 192.168.22.20

```
ip dhcp pool VLAN20_POOL
network 192.168.20.0 255.255.255.0
default-router 192.168.20.1
dns-server 8.8.8.8
```

```
ip dhcp pool VLAN21_POOL
network 192.168.21.0 255.255.255.0
default-router 192.168.21.1
dns-server 8.8.8.8
```

```
ip dhcp pool VLAN22_POOL
network 192.168.22.0 255.255.255.0
default-router 192.168.22.1
dns-server 8.8.8.8
```

```
! Default route towards FortiGate
ip route 0.0.0.0 0.0.0.0 10.0.4.1
```

```
end
```

```
wr
```

---

```
hostname SW1
no ip domain-lookup
```



vlan 20

name VLAN20\_RIGHT

vlan 21

name VLAN21\_RIGHT

vlan 22

name VLAN22\_RIGHT

! Trunks to MLS1

interface range e0/0 - 1

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

! Trunks to SW2 and SW3

interface e1/1

description To SW2

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

interface e1/0

description To SW3

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

! Access ports VLAN20 (PC7, PC8)

interface e0/2

switchport mode access

switchport access vlan 20

no shutdown

interface e0/3

switchport mode access

switchport access vlan 20

no shutdown

end

wr

---

hostname SW2

no ip domain-lookup

vlan 20

name VLAN20\_RIGHT

vlan 21

name VLAN21\_RIGHT

vlan 22

name VLAN22\_RIGHT

! Trunks

```
interface e1/1
```

```
description To SW1
```

```
switchport mode trunk
```

```
switchport trunk allowed vlan 20,21,22
```

```
no shutdown
```

```
interface e1/0
```

```
description To SW3
```

```
switchport mode trunk
```

```
switchport trunk allowed vlan 20,21,22
```

```
no shutdown
```

```
! Access ports VLAN21 (PC9, PC10/11 depending on where you plug)
```

```
interface e0/2
```

```
switchport mode access
```

```
switchport access vlan 21
```

```
no shutdown
```

```
interface e0/3
```

```
switchport mode access
```

```
switchport access vlan 21
```

```
no shutdown
```

```
end
```

```
wr
```

---

hostname SW3

no ip domain-lookup

vlan 20

name VLAN20\_RIGHT

vlan 21

name VLAN21\_RIGHT

vlan 22

name VLAN22\_RIGHT

! Trunks

interface e1/0

description To SW1

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

interface e1/1

description To SW2

switchport mode trunk

switchport trunk allowed vlan 20,21,22

no shutdown

! Access ports VLAN22 (PC10, PC12)

interface e0/2

```
switchport mode access
```

```
switchport access vlan 22
```

```
no shutdown
```

```
interface e0/3
```

```
switchport mode access
```

```
switchport access vlan 22
```

```
no shutdown
```

```
end
```

```
wr
```