

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