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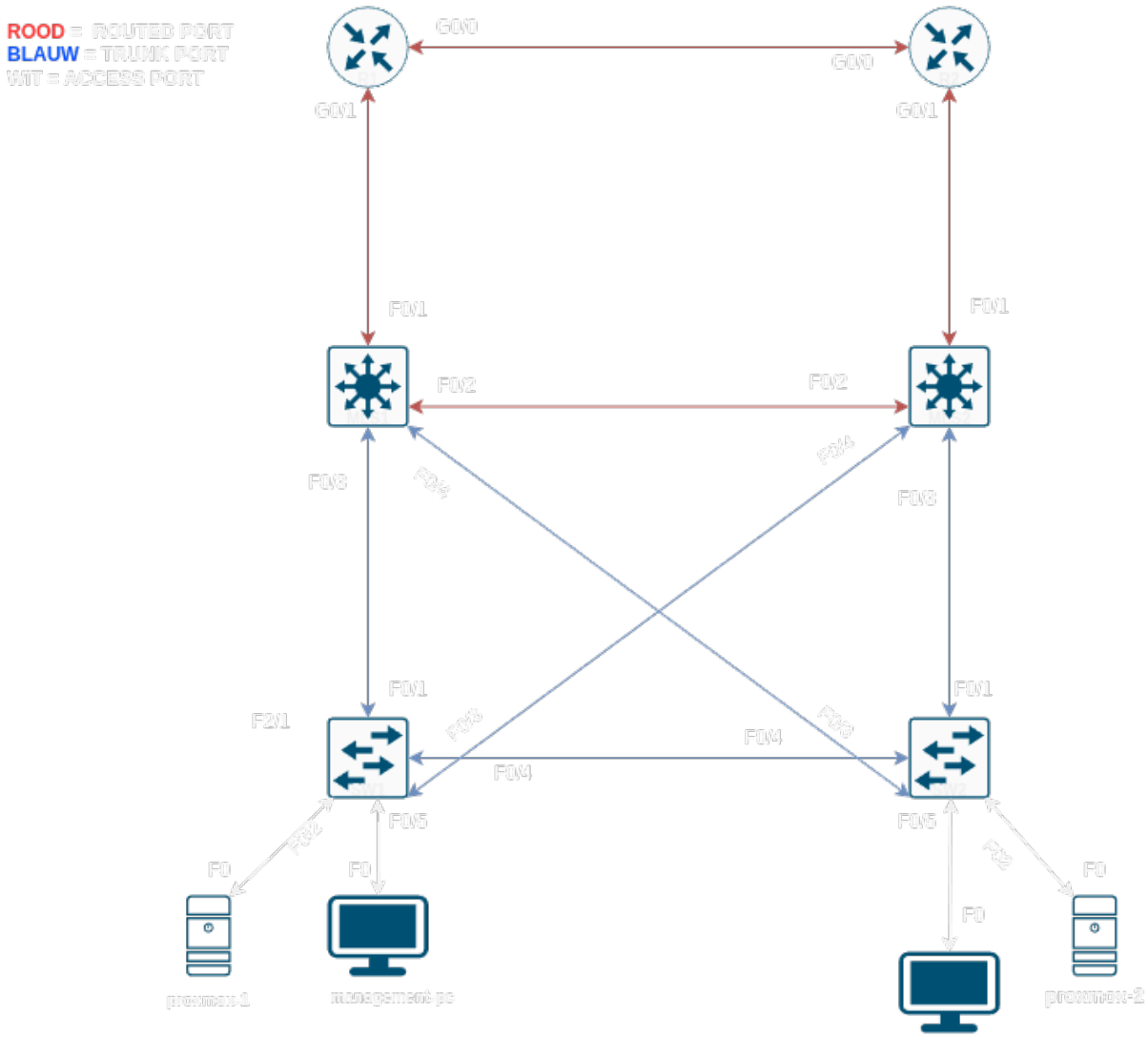
1 Netwerk topologie



1.1 VLAN TABEL

Vlan id	Naam	Beschrijving	Subnet
10	servers	servers	192.168.10.0/24
20	clients	Clients & devices	192.168.20.0/24
99	management	management	192.168.99.0/28
100	native	Native network traffic	/
999	blackhole		

1.2 Subnets

Subnets	Subnetmasker	Gateway	Beschrijving
192.168.10.0/24	255.255.255.0	192.168.10.1	Servers vlan
192.168.20.0/24	255.255.255.0	192.168.20.1	Clients vlan
192.168.99.0/28	255.255.255.240	192.168.99.0	Management vlan
192.168.101.0/30	255.255.255.252	192.168.101.1	MLS1 <--> R1 routed port
192.168.101.4/30	255.255.255.252	192.168.101.5	MLS1 <---> MLS2 routed port
192.168.101.8/30	255.255.255.252	192.168.101.9	MLS2 <--> R2 routed port
192.168.101.12/30	255.255.255.252	192.168.101.13	R1 <--> R2 routed port

1.3 Addresseringschema

Device	Interface / Port	Connected device	IPv4 ADDRESS	Subnet Mask	Default Gateway
R1	VLAN 99				
	G0/0	R2	192.168.101.13	255.255.255.252	
	G0/1	MLS1	192.168.101.2	255.255.255.252	
R2	VLAN 99				
	G0/0	R1	192.168.101.14	255.255.255.252	
	G0/1	MLS2	192.168.101.10	255.255.255.252	
SW1	VLAN99		192.168.99.4	255.255.255.240	
	F0/1	MLS1			
	F0/2	Proxmox-1			
	F0/3	MLS2			
	F0/4	SW2			
	F0/5	Management-pc			
SW2	VLAN 99		192.168.99.5	255.255.255.240	
	F0/1	MLS2			
	F0/2	Proxmox-2			
	F0/3	MLS1			
	F0/4	SW1			
	F0/5	SW1			
MLS1	VLAN 99		192.168.99.2	255.255.255.240	
	VLAN 10		192.168.10.254	255.255.255.0	
	VLAN 20		192.168.20.1	255.255.255.0	

	VLAN 100				
	F0/1	R1	192.168.101.1	255.255.255.252	
	F0/2	MLS2	192.168.101.5	255.255.255.252	
	F0/3	SW1			
	F0/4	SW2			
MLS2	VLAN 99		192.168.99.1	255.255.255.240	
	VLAN 10		192.168.10.253	255.255.255.0	
	VLAN 20		192.168.20.2	255.255.255.0	
	VLAN 100				
	F0/1	R2	192.168.101.9		
	F0/2	MLS1	192.168.101.6		
	F0/3	SW2			
	F0/4	SW1			
Management pc	F0	SW1	192.168.99.8	255.255.255.240	192.168.99.3
Client -1	F0	SW2	192.168.20.10	255.255.255.0	192.168.20.3
Proxmox-1	F0	SW1	192.168.10.20	255.255.255.0	192.168.10.252
DC-1		Proxmox-1	192.168.10.2	255.255.255.0	192.168.10.252
FS-1		Proxmox-2	192.168.10.3	255.255.255.0	192.168.10.252
Proxmox-2		SW2	192.168.10.21	255.255.255.0	192.168.10.252
VM – SM-backup		Proxmox-1	192.168.10.4	255.255.255.0	192.168.10.252

1.4 HSRP schema

Group	Interface	Virtual IP	Priority	Preemption	Active router	Standby router
10	VLAN 10	192.168.10.252	150	Enabled	192.168.10.254	192.168.10.253
20	VLAN 20	192.168.20.3	150	Enabled	192.168.20.1	192.168.20.2
99	VLAN 99	192.168.99.3	150	Enabled	192.168.99.1	192.168.99.2

1.5 VM schema

hostname	ip-address	OS	description
DC-1	192.168.10.2	WS2022	Domain-controller
FS-1	192.168.10.3	WS2022	File-server
vm-backup	192.168.10.4	WS2022	Backup-server

2 Implementatie-opstelling

2.1 Vlans aanmaken

2.1.1 Algemene configuratie

vlans is voor alle switches hetzelfde.

```
SW1 # vlan 10
SW1 (config-vlan) #  name servers
SW1 # interface vlan 10
SW1(config-if) # description servers

SW1 # vlan 20
SW1 (config-vlan) #  name clients
SW1 # interface vlan 20
SW1(config-if) # description clients

SW1 # vlan 99
SW1 (config-vlan) #  name management
SW1 # interface Vlan 99
SW1(config-if) # description management vlan
SW1(config-if) # ip address 192.168.99.4 255.255.255.240

SW1 # vlan 100
SW1 (config-vlan) #  name native
SW1 # interface vlan 100
SW1(config-if) # description native-vlan

SW1 # vlan 999
SW1 (config-vlan) #  name blackhole
SW1 # interface vlan 999
SW1 # ip default-gateway 192.168.99.3
```

default-gateway & ip-address SVI is verschillend voor SW2

```
SW2 # ip default-gateway 192.168.99.3
SW2 # ip address 192.168.99.5 255.255.255.240
```

2.2 Switchports (trunk & access)

2.2.1 SW1

```
SW1 # interface FastEthernet0/1
SW1(config-if) # switchport mode trunk
```

```
SW1(config-if) # switchport trunk native vlan 100
SW1(config-if) # switchport nonegotiate

SW1 # interface FastEthernet0/2
SW1(config-if) # switchport mode access
SW1(config-if) # switchport access vlan 10


SW1 # interface FastEthernet0/3
SW1(config-if) # switchport mode trunk
SW1(config-if) # switchport trunk native vlan 100
SW1(config-if) # switchport nonegotiate

SW1 # interface FastEthernet0/4
SW1(config-if) # switchport mode trunk
SW1(config-if) # switchport trunk native vlan 100
SW1(config-if) # switchport nonegotiate

SW1 # interface FastEthernet0/5
SW1(config-if) # switchport mode access
SW1(config-if) # switchport access vlan 99

SW1 # interface range F0/6 - 24
SW1(config-if) # switchport mode access
SW1(config-if) # switchport access vlan 999

SW1 # interface range G0/1 - 2
SW1(config-if) # switchport mode access
SW1(config-if) # switchport access vlan 999
```

2.2.2SW2

```
SW2 # interface FastEthernet0/1
SW2(config-if) # switchport mode trunk
SW2(config-if) # switchport trunk native vlan 100
SW2(config-if) # switchport nonegotiate

SW2 # interface FastEthernet0/2
SW2(config-if) # switchport mode access
SW2(config-if) # switchport access vlan 10


SW2 # interface FastEthernet0/3
SW2(config-if) # switchport mode trunk
SW2(config-if) # switchport trunk native vlan 100
SW2(config-if) # switchport nonegotiate

SW2 # interface FastEthernet0/4
SW2(config-if) # switchport mode trunk
SW2(config-if) # switchport trunk native vlan 100
SW2(config-if) # switchport nonegotiate

SW2 # interface FastEthernet0/5
SW2(config-if) # switchport mode access
SW2(config-if) # switchport access vlan 20

SW2 # interface range F0/6 - 24
SW2(config-if) # switchport mode access
SW2(config-if) # switchport access vlan 999

SW2 # interface range G0/1 - 2
```

```
SW2(config-if) # switchport mode access
SW2(config-if) # switchport access vlan 999
```

2.2.3 MLS1

```
MLS1 # interface F0/3
MLS1(config-if)#switchport trunk encapsulation dot1q
MLS1(config-if) # switchport mode trunk
MLS1(config-if) # switchport trunk native vlan 100
MLS1(config-if) # switchport nonegotiate

MLS1 # interface F0/4
MLS1(config-if)#switchport trunk encapsulation dot1q
MLS1(config-if) # switchport mode trunk
MLS1(config-if) # switchport trunk native vlan 100
MLS1(config-if) # switchport nonegotiate

MLS1 # interface range F0/5 - 24
MLS1(config-if-range) # switchport mode access
MLS1(config-if-range) # switchport access vlan 999
```

2.2.4 MLS2

```
MLS2 # interface F0/3
MLS2(config-if) # switchport mode trunk
MLS2(config-if) # switchport trunk native vlan 100
MLS2(config-if) # switchport nonegotiate

MLS2 # interface F0/4
MLS2(config-if) # switchport mode trunk
MLS2(config-if) # switchport trunk native vlan 100
MLS2(config-if) # switchport nonegotiate

MLS2 # interface range F0/5 – 24
MLS2(config-if-range) # switchport mode access
MLS2(config-if-range) # switchport access vlan 999
```

2.3 Intervlan routering

2.3.1 MLS1

```
MLS1 # interface Vlan20
MLS1(config-if) # ip address 192.168.20.1 255.255.255.0

MLS1 # interface Vlan99
MLS1(config-if) # ip address 192.168.99.1 255.255.255.240

MLS1 # interface Vlan10
MLS1(config-if) # ip address 192.168.10.254 255.255.255.0
MLS1(config) # ip routing
```

2.3.2 MLS2

```
MLS2 # interface vlan 99
MLS2(config-if) # ip address 192.168.99.1 255.255.255.240
MLS2(config) # ip routing
```

2.4 Routed ports

2.4.1 MLS1

```
MLS1 # interface F0/1
MLS1(config-if) # no switchport
MLS1(config-if) # ip address 192.168.101.1 255.255.255.252

MLS1 # interface F0/2
MLS1(config-if) # no switchport
MLS1(config-if) # ip address 192.168.101.5 255.255.255.252
```

2.4.2 MLS2

```
MLS2 # interface F0/1
MLS2(config-if) # no switchport
MLS2(config-if) # ip address 192.168.101.9 255.255.255.252

MLS2 # interface F0/2
MLS2(config-if) # no switchport
MLS2(config-if) # ip address 192.168.101.6 255.255.255.252
```

2.4.3 R1

```
R1 # interface GigabitEthernet0/0
R1(config-if) # ip address 192.168.101.13 255.255.255.252


R1 # interface GigabitEthernet0/1
R1(config-if) # ip address 192.168.101.2 255.255.255.252
```

2.4.4 R2

```
R2 # interface GigabitEthernet0/0
R2(config-if) # ip address 192.168.101.14 255.255.255.252

R2 # interface GigabitEthernet0/1
R2(config-if) # ip address 192.168.101.10 255.255.255.252
```

2.5 HSRP

2.5.1 MLS1

```
MLS1 (config)# interface vlan 10
MLS1 (config-if)# standby version 2
MLS1 (config-if)# standby 10 ip 192.168.10.252
MLS1 (config-if)# standby 10 priority 150
MLS1 (config-if)# standby 10 preempt

MLS1 (config)# interface vlan 99
MLS1 (config-if)# standby version 2
MLS1 (config-if)# standby 99 ip 192.168.99.3

MLS1 (config)# interface vlan 20
MLS1 (config) standby version 2
MLS1 (config-if)# standby 20 ip 192.168.20.3
```

2.5.2 MLS2

```
MLS2 (config)# interface vlan 10
MLS2 (config-if)# standby version 2
MLS2 (config-if)# standby 10 ip 192.168.10.252

MLS2 (config)# interface vlan 99
MLS2 (config-if)# standby version 2
MLS2 (config-if)# standby 99 ip 192.168.99.3
MLS2 (config-if)# standby 99 priority 150
MLS2 (config-if)# standby 99 preempt

MLS2 (config)# interface vlan 20
MLS2 (config-if)# standby version 2
MLS2 (config-if)# standby 20 ip 192.168.20.3
```

2.6 Remote management & Security instellen

2.6.1 Algemene configuratie

```
SW1 # hostname SW1
SW1 # enable secret ****
SW1 # ip domain-name servermaffia.test
SW1 # crypto key generate rsa general-keys modulus 2048
SW1 # username servermaffia secret ****
SW1 # line vty 0 15
SW1(config-line) # password ****
SW1(config-line) # login
SW1(config-line) # login local
SW1(config-line) # transport input ssh
SW1 # line console 0
SW1(config-line) # password ****
SW1(config-line) # login
SW2 # service password-encryption
SW2 # banner motd Unauthorized access is forbidden!
SWZ copy running-config startup-config
```

Deze configuratie is voor elk netwerk device hetzelfde